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TWENTY-FIFTH

ANNIVERSARY

OF THE

AMERICAN CHEMICAL SOCIETY

NEW YORK CITY,

April Twelfth and Thirteenth, 1901.

EASTON, PA.:
THE CHEMICAL PUBLISHING CO.
1902.

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INTRODUCTORY.

The first suggestions for the celebration of the twenty-fifth anniversary of the founding of the American Chemical Society were made by Dr. Charles Baskerville in the following communication which was presented to the Council of the Society at its meeting in Columbus, Ohio, August 21, 1899: "I would suggest that on account of the twenty-fifth anniversary of the establishment of the Society, a medal be given to that chemist who, in the opinion of the Council, has made the most valuable contribution to chemical knowledge during the current year, and further that the medal be called the Priestley medal."

These suggestions were referred by the Council to a committee of three for consideration and recommendation, and under the authority of the Council, President Morley appointed as such committee Messrs. Charles E. Munroe, Albert B. Prescott and J. W. Mallet.

At the New Haven meeting in December, 1899, the committee presented the following report:

WASHINGTON, D. C., December 16, 1899.

Dr. Edward W. Morley,
President American Chemical Society:

SIR: Your committee to which was referred the consideration of the motion, "That on the twenty-fifth anniversary of the establishment of the Society, a medal be given to that chemist who, in the opinion of the Council, has made the most valuable contribution to chemical knowledge during the current year, and further, that the medal be called the 'Priestley Medal,'" begs to report that it deems it inadvisable for the Society to found a medal from funds obtained from dues of members, since in its judgment medals and prize funds should be independently acquired for the specific purposes named by the donors.

Your committee recommends that some recognition be made of the twenty-fifth anniversary of the founding of the Society, which will occur on April 6, 1901, and it suggests that provision be made for a special memorial address, and that a statement of

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what the Society has accomplished to that date be published, and issued to all chemists in America.

Respectfully submitted,

CHARLES E. MUNROE, *Chairman*,
J. W. MALLET,
ALBERT B. PRESCOTT,
Committee.

The report was accepted and its recommendations adopted, and at the meeting of the Council in New York City, June 25, 1900, the president of the Society was "authorized and directed to appoint a committee, of which he himself shall be chairman, with power to arrange for the celebration of the twenty-fifth anniversary of the foundation of the Society, which will occur on April 6, 1901, in conformity with the action taken by the Council upon that subject at the last general meeting of the Society." The Anniversary Committee, as finally constituted, was organized as follows :

Chairman—Wm. McMurtrie.

Secretary—Albert C. Hale.

Finance—John H. Long, C. B. Dudley, John Alden, F. E. Dodge and Alfred Springer.

Invitations—Edward W. Morley, George F. Barker, W. B. Rising, Ira Remsen, C. L. Jackson, S. W. Johnson and H W. Wiley.

History—H. C. Bolton, A. B. Prescott, Albert C. Hale, Henry Morton, C. A. Goessmann and Marcus Benjamin.

Program and Papers—C. A. Doremus, W. P. Mason, H. H. Nicholson, Jas. Lewis Howe and L. M. Dennis.

Reception—J. W. Mallet, J. H. Appleton, C. F. Chandler, F. W. Clarke and Geo. C. Caldwell.

Census—Charles Baskerville, C. E. Munroe, Edgar F. Smith, W. A. Noyes and Louis Kahlenberg.

The New York Section of the Society, at its meeting January 11, 1901, passed unanimously the following resolution :

Resolved, "That the New York Section of the American Chemical Society herewith extends a most cordial invitation to the Society to celebrate the twenty-fifth anniversary of its foundation next April, in New York City, and the chairman of the New York Section is hereby authorized and directed to appoint such

local committees as he may deem expedient in order to aid in perfecting arrangements for such celebration.''

The invitation thus extended was accepted by the Anniversary Committee and it was decided that the celebration should take the form of a general meeting of the Society to be held April 12 and 13, 1901. The Local Committee of Arrangements for the twenty-fifth anniversary celebration, as appointed by the New York Section, was organized as follows :

Chairman—C. A. Doremus.

Secretary—Durand Woodman.

Finance—M. E. Waldstein, M. Toch, George C. Stone, Hugo Schweitzer, C. F. Chandler, W. H. Nichols and J. B. F. Herreshoff.

Meetings and Entertainments—E. E. Smith, W. J. Schieffelin, Morris Loeb, J. F. Geisler and J. H. Wainwright.

Press and Printing—Charles F. McKenna, C. L. Reese and Durand Woodman.

Membership—T. J. Parker, M. T. Bogert, Ludwig Saarbach, Waldemar Lee and Clifford Richardson.

Hotels and Transportation—A. P. Hallock, J. H. Wainwright, Clifford Richardson and E. F. Hicks.

Registration—J. F. Geisler, C. A. Doremus, Clifford Richardson and T. J. Parker.

This committee, together with the Anniversary Committee appointed by the president of the American Chemical Society, met at the Chemists' Club, New York City, Thursday, February 21, 1901, and organized as a joint committee to undertake all preliminary arrangements and the general management of the twenty-fifth anniversary celebration. The joint committee elected as its officers William McMurtrie, chairman, Albert C. Hale, secretary, and Martin E. Waldstein, treasurer, and entrusted the details of the work to the subcommittees already appointed.

THE ANNIVERSARY CELEBRATION.

The twenty-fifth anniversary of the founding of the American Chemical Society was celebrated by a general meeting of the Society, held in New York City, Friday and Saturday, April 12 and 13, 1901. The sessions were held in the Assembly Hall of the Chemists' Club, 108 W. 55th Street, by special invitation of the trustees of the club. The rooms of the club were the headquarters for the anniversary celebration, and the privileges of the club were extended to all the visiting chemists.

During the forenoon of Friday, April 12th, the Registration Committee was in attendance at the Chemists' Club, where the visiting chemists were informally received and welcomed. At 1 P.M. on Friday, luncheon was served at the club, through the courtesy of the New York Section of the Society.

The first session of the meeting was called to order at 2.40 P.M. by Dr. C. A. Doremus, chairman of the New York Section, who welcomed the chemists on behalf of the local section, and outlined the general plan for the celebration. Dr. Doremus then introduced Mr. T. J. Parker, president of the Chemists' Club, who addressed the following words of welcome:

"On behalf of the Board of Trustees and members of the Chemists' Club, I desire to extend to you a most hearty welcome on this occasion, to our club, our city and our homes. We extend to you the courtesies of our club house and all the facilities it affords. We trust that if you have time you will prolong your stay with us so that during the ensuing week, should you desire to visit the many points of interest which this great metropolis of the Western Hemisphere offers, you can enter its portals and avail yourselves of the rest and social intercourse among yourselves and its members, which the occasion of this meeting affords.

"You well know we draw our membership of this club from your Society and our objects are identical, coupled with the scientific and social element which club organization permits.

"We hope you will carry back with you to your homes the most pleasant remembrances of your visit, and it is the heartfelt wish of all the members of the Chemists' Club that the good fellowship enjoyed and acquaintances formed here may be lasting.

"The aim and desire of the Chemists' Club are well-known to you. Our most earnest wish is that it may be the nucleus around which all allied scientific societies and clubs may crystallize, with the ultimate result that in conjunction with them a beautiful and fitting home may be provided, which shall be a credit to science and to our city. This object may possibly be accomplished by our endeavors, with the assistance of those who have the progress of science at heart.

"I will not detain you with further remarks, but will close with bidding the gentlemen again a most hearty welcome from the Chemists' Club."

Professor F. W. Clarke, president of the American Chemical Society, responded as follows :

"*Mr. Chairman and Gentlemen of the American Chemical Society :*

"I think we can all join in thanking the local section of the American Chemical Society for the very kind welcome and greeting which they have given us. I think we cannot only thank them, but we can congratulate the city of New York in having the largest section of the Society and in having such an admirable meeting place as the Chemists' Club affords. The New York Section is privileged above all others of our Society in this particular.

"I am glad to say the Society is growing in a most healthy and satisfactory way. The secretary will be likely to inform you of the number of members now enrolled, of the number of nominees awaiting election and the number yet to be qualified. We are now past the 1900th mark and nearing the 2000th, and I think by the summer meeting the 2000th line will have been passed. This, however, is not enough. We should have in the United States 4000 members at least, and this is the aim to which we should strive. I think we should also make strong efforts toward securing for the Society an Endowment Fund. We are doing all we can with the means now at our disposal. We are publishing a journal, we are maintaining local sections, we are doing all the Society could be expected to do with our resources, but we should have at least $200,000 of permanent funds in order to do the best work of which the Society is capable.

"When we consider the fact that chemical industries depend for their very existence upon chemists and chemical researches, and

that the latter add millions of dollars every year to the wealth of the country, I think we can well ask that some of this wealth should be given to the endowment of the science which has made it possible. Every year great sums are given to establish libraries, educational institutions, museums, and art galleries. Why should we not have endowments for chemical research? The amount I have named, $200,000, would be a modest sum for the work we have to do, and I believe that with a proper appeal to the men who have made their fortunes from chemical industries, such an endowment might be forthcoming.

"You will see by the historical sketches of the American Chemical Society which are to be read to-day, that the Society in its present form represents the outcome of three distinct movements—one represented by the American Chemical Society as organized in 1876, one by the Chemical Section of the American Association, and one by the Chemical Society of Washington. These three organizations were distinct absolutely, but they are now practically one. The Washington Society has become a local section, and Section "C" of the American Association holds its annual meeting in immediate connection with the summer meeting of this Society, so that it is in perfect harmony with us and in complete cooperation.

"There is a long program before us and I am inclined rather to assume the privilege of the presiding officer of remaining silent and letting other people do the talking.

"I congratulate the Society upon its twenty-fifth anniversary."

After the reading and approval of the minutes of the last general meeting, the secretary read the following telegram of congratulation from the Chicago Section.

"CHICAGO, ILL., April 12, 1901.

"*F. W. Clarke, care of A. C. Hale,*

551 Putnam Ave., Brooklyn:

"The Chicago Section congratulates the parent Society on its twenty-fifth birthday and hopes the future will be as successful as the past.

F. LENGFELD."

Among many other communications received relative to the anniversary occasion, those given below are recorded as of special interest.

"THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS,
NO. 12, WEST THIRTY-FIRST ST., NEW YORK,
March 16, 1901.

"*Professor Albert C. Hale,*
551 Putnam Ave., Brooklyn, N. Y.

"DEAR SIR: I have received by the courtesy of Mr. Edward W. Morley, of Cleveland, a kindly worded invitation to take part in the banquet of the American Chemical Society on April 13th.

"While appreciating the consideration which has given me such long notice in advance, I am compelled by pressure of a previous engagement to decline what has been so kindly an intention on the part of your committee.

"The lines of the work of the mechanical engineer and the chemist are running side by side with each other in the field of modern industry, and with a tendency, as it seems to me, to converge at many points where the applied science of chemistry passes into manufacturing. Mechanical engineering recognizes what its profession owes to chemistry and is glad to present on the occasion of this banquet its sincere congratulations upon the twenty-fifth anniversary of the formation of the Society, and to add to these congratulations the warm wishes for prosperity and robust growth in the future. I beg to remain,

"Very truly,
"F. R. HUTTON, *Secretary.*"

"NEWPORT, March 18, 1901.

"DEAR PROFESSOR MORLEY:

"I duly received the flattering invitation of the American Chemical Society for April 13th next, and the sessions of the Society on the previous day. It would give me the greatest pleasure to avail myself of these invitations and to take an active part in the proceedings. But the state of my health is such that I cannot hope to be able to leave my home. I have the heartiest interest in the work of the Society. It is with extreme regret that I must content myself with an expression of my best wishes for the long continuance of its good and useful work.

"Sincerely yours,
"WOLCOTT GIBBS."

"ST. PETERSBURG D. 21 März (3 April), 1901.

"HOCHGEEHRTER HERR KOLLEGE:

"Empfangen Sie meinen wärmsten Dank für die so sehr ehrenvolle Einladung dem Jubelfeste der amerikanischen chemischen Gesellschaft beizuwohnen. Europa habe ich so ziemlich ganz durchstreift, allein Amerika ist mir nicht durch den Augenschein bekannt geworden. Wie gern wäre ich längst schon zu Ihnenher über gekommen, läge nicht das weite Meer dazwischen! Das Seereisen greift mich stets sehr an und darum habe ich mich vor dem weiten Wege immer gefürchtet. Allein, wollte ich auch diesmal meine Furcht überwinden, so stehen noch andere Hindernisse im Wege, die es mir unmöglich machen augenblicklich von hier fort zu kommen. Ich habe an der Universität Moskau das Staatsexamen der Abiturienten, als Präsident, zu leiten und erst im Juni werde ich von meinen dienstlichen Verpflichtungen befreit. Es bleibt mir daher nur übrig *schriftlich* an Ihrer Feier Theil zu nehmen. Aber am 13 April will ich Ihrer ganz besonders gedenken! Habe ich doch, von meiner langen Lehrzeit her, manchen ehemaligen Schüler, guten Freund und Kollegen jenseits des Oceans!

"Erst 25 Jahre zählt Ihre chemische Gesellschaft, allein sie hat sich wie übrigens Alles in Amerika, überaus rasch entwickelt. Ich weiss mich noch recht gut der Zeit zu erinnern wo nur ab und zu chemische Neuigkeiten von jenseits des Oceans zu uns herüber kamen. Wie hat sich das Alles, in kurzer Zeit, verändert! Immer zahlreicher und immer bedeutender werden die Arbeiten der amerikanischer Chemiker und bald werden sie viele Länder der alten Welt uberflügelt haben. Wie unendlich reich und glücklich hat die Natur Ihre Heimath ausgerüstet, allein auch der emsige Bienenfleiss seiner Bewohner macht, dass Amerika das Land der Zukunft ist. So rufe ich denn der amerikanischen chemischen Gesellschaft ein donnerndes Lebehoch zu und wünche mir nur noch so viel Lebenskraft um dem weiteren Aufschwung Ihrer Gesellschaft recht lange folgen zu können.

"Ganz ergebenst,

F. BEILSTEIN."

"ROYAL INSTITUTION OF GREAT BRITAIN,
25th March, 1901.

"DEAR PROFESSOR MORLEY:

"I feel indeed honoured by the invitation of the American Chemical Society to be a guest at the anniversary banquet on April 13, and my regret is great when I have to confess that my engagements here will prevent my accepting. What a delight it would have been to me had it been possible to cross the Atlantic! As things stand, I can only say remember me to old friends and thank the committee for their kind invitation. I cannot lose the opportunity of congratulating the American Chemical Society on the splendid work it has achieved in the past, and I wish it ever-increasing success in the future.

"With kindest regards, ever yours,
"JAMES DEWAR."

"PARIS, 27 Mars, 1901.

"M. Berthelot, Collège de France, rémercie la Société Chimique Americaine de l'honneur de son invitation á son banquet á New York; il regrette de ne pouvoir s'y rendre. Mais il prie le President de transmettre á la Société l' expression de sa complete sympathie. Avec haûte considération,
"M. BERTHELOT."

"Directeur de la Chambre Centrale des Poids et Mésures de l'Empire de Russie.

"24 March (6 April), 1901. ST. PETERSBOURG,
PERSPECTIVE ZABALKANSKI, 19.

"DEAR SIR: The letter of March 13, 1901, containing the invitation to take part in the celebration of the twenty-fifth anniversary of the formation of the American Chemical Society I have received, and beg you to present to the Society my sincerest congratulations. I am very sorry that at the moment different very pressing work does not allow me to accept your very kind and honorable invitation. Yours truly,
"D. MENDELÉEFF.

"*To Professor Albert C. Hale, Secretary of the American Chemical Society, 551 Putnam Ave., Brooklyn, N. Y.*"

"7 Kensington Park Gardens, London W.,
March 26, 1901.

"*Professor Albert C. Hale,*
551 Putnam Ave., Brooklyn, N. Y.

"My Dear Professor Hale:

"I very highly appreciate the compliment conveyed by Dr. Morley, on behalf of the Committee of Invitation, by inviting me to the banquet in New York on April 13th, and to assist at the celebration of the 25th anniversary of the American Chemical Society.

"I much regret that circumstances prevent my acceptance of the kind invitation. I have never visited your hospitable shores, and have always looked forward to such a trip as one of the anticipated pleasures of my life. Unfortunately, however, ill health among my family will keep me near home for some time, and my Easter holiday will be spent in the Isle of Wight instead of in the pleasant company of the many friends I have the pleasure of numbering among your men of science.

"All my good wishes are for the pleasant and satisfactory carrying out of the anniversary celebrations, and on the 13th of April I will join you in the toast, 'Success and Prosperity to the American Chemical Society.'

"With kind regards to my numerous friends in the Society,

"Believe me,

"Very sincerely yours,

"William Crookes."

———

"Charlottenburg, 29/3, 1901.

"My Dear Colleagues:

"I regret extremely to be unable to accept your invitation for 13 April, being just then in Paris to represent the Berlin Academy at the international meeting of learned societies. I gladly use this occasion to congratulate the American Chemical Society with its twenty-fifth anniversary and add my best wishes for its growth and prosperity.

"Very truly yours,

"J. H. van' t Hoff."

"CANNES (FRANCE), den 4 April, 1901.

"HOCHGEEHRTER HERR PROFESSOR:

"Die freundliche Einladung zum 25 jährigen Stiftungsfeste, mit welcher die American Chemical Society mich beehrte, ist leider erst heute hier in meine Hände gelangt. Ich bitte desshalb die Verzögerung der Antwort gütigst entschuldigen zu wollen. Zu meinem grössten Bedauern ist es mir nicht möglich, derselben zu folgen, da am 15 d. M. meine Ferien zu Ende sind. Ich muss mich also darauf beschränken, der Gesellschaft zu dem Feste meinen herzlichen Glückwunsch dazubringen und die Hoffnung auszusprechen, dass sie im neuen Lebensabschnitt blühen und gedeihen möge zu Nutz und Ehr unserer Wissenschaft.

"Mit vorzüglicher Hochachtung ergebenst,

"EMIL FISCHER.

"*Herrn Professor A. Hale, New York.*"

"ZÜRICH, 27 March, 1901.

"*Professor Albert C. Hale,*
Brooklyn, New York.

"DEAR PROFESSOR HALE:

"I have received the invitation of the American Chemical Society to the banquet to be given April 13th in celebration of the twenty-fifth anniversary of the foundation of the Society.

"I am very grateful for the honor bestowed upon me by this invitation, and very few things in this world would have given me greater pleasure than availing myself of it, and meeting the flower of my American confrères. Since, however, my term commences on April 15th, this circumstance, apart from all other reasons, prevents me from paying you a visit on that occasion, and I must confine myself to sending you my very best wishes for a continuation of that prosperity which the American Chemical Society has enjoyed during the first quarter of a century of its existence. This wish is prompted not merely by our common interest in chemistry, but by the respect and personal friendship I feel for the numerous members of your Society whom I have been privileged to meet on both sides of the ocean. I conclude with the old motto applied to your comparatively young Society: 'Vivat, floreat, crescat.'

"Believe me, dear Professor Hale, yours most truly,

"GEORGE LUNGE."

UNIVERSITY OF LONDON, SOUTH KENSINGTON, S. W.,
March 30, 1901.

"DEAR PROFESSOR HALE:

"I beg to acknowledge receipt of letter from E. W. Morley, of Cleveland, inviting me to take part in a banquet at New York, on April 13th, to celebrate the twenty-fifth anniversary of the foundation of the American Chemical Society.

"In reply I need hardly say that it would have been a very great pleasure and satisfaction to me to have been able to accept this very kind invitation and to meet my many valued friends amongst American Chemists.

"Unfortunately, I am so deeply engaged at the present time as vice-chancellor of the University of London in reconstructing that university that my presence in London is a necessity, and I am forced to decline the invitation so thoughtfully sent to me. I must, therefore, content myself with expressing my best and most hearty wishes for the continued success and usefulness of the American Chemical Society, and with sending my sincere and friendly greetings to all my brother chemists assembled round the festive board.

"I am, dear sir,

"Yours faithfully,

"HENRY E. ROSCOE."

"UNIVERSITY COLLEGE, LONDON, GOWER ST., W. C.,
March 25, 1901.

"DEAR PROFESSOR HALE:

"I am very sorry that it is impossible for me to accept the kind invitation addressed to me by many American friends for the 13th April. I should much have liked to be with you, and to join you in celebrating the twenty-fifth anniversary of your Society. But engagements and distance render it out of the question. However, you may rest assured of my most cordial congratulations, especially that the Society is so flourishing, and may now be regarded as a full-grown adult. Please give my special kind regards to my friends on the invitation committee, and believe me,

"Yours sincerely,

"W. RAMSAY.

"*Professor Albert C. Hale.*"

"COPENHAGEN, 28 March, 1901.

"*Professor Albert C. Hale, 551 Putnam Avenue, Brooklyn, N. Y.*

"DEAR SIR: I beg to thank you for your invitation to assist at the celebration of the twenty-fifth anniversary of the foundation of the American Chemical Society, which I received to-day, but very much regret to be prevented in accepting the same.

"I, however, beg to present my best compliments and wishes for the prosperity of your Society and remain, Dear Sir,

"Yours very truly,

"JULIUS THOMSEN."

"UPSALE, the 28th of March, 1901.

"*Professor Albert C. Hale.*

"DEAR SIR: Most obliged for the kind invitation to the celebration of the twenty-fifth anniversary of the American Chemical Society. I am sorry to decline as I have no leisure for going to America in April. I beg to forward my sincere remerciement to the committee. Yours very truly,

"P. T. CLEVE."

The following is a list of representatives of other scientific bodies who accepted the invitation to attend the twenty-fifth anniversary celebration as guests of the American Chemical Society:

Professor Ira Remsen, secretary of the National Academy of Sciences.

Doctor Clifford Richardson, chairman of the New York Section of the Society of Chemical Industry.

Thomas J. Parker, president of the Chemists' Club.

Professor L. O. Howard, secretary of the American Association for the Advancement of Science.

J. James R. Croes, president of the American Society of Civil Engineers.

Charles Warren Hunt, secretary of the American Society of Civil Engineers.

M. T. Bogert, secretary of the Chemists' Club.

Edward W. Morley, honorary member of the American Chemical Society.

R. S. Woodward, president of the New York Academy of Sciences.

R. E. Dodge, Secretary of the New York Academy of Sciences.

Eben Erskine Olcott, president of the American Institute of Mining Engineers.

Carl Hering, president of the American Institute of Electrical Engineers.

Ralph W. Pope, secretary of the American Institute of Electrical Engineers.

C. F. Cox, president of the Scientific Alliance of New York.

H. M. MacCracken, chancellor of New York University.

Miles M. O'Brien, president of the Board of Education, New York City.

H. Schweitzer, honorary secretary of the New York Section of the Society of Chemical Industry.

The program of papers for the session began with a series of three reports from the History Committee, which were presented in abstract as follows:

"Chemical Societies of the XIX Century," by H. Carrington Bolton; read by C. A. Doremus.

"Historical Sketch of the American Chemical Society," by Albert C. Hale.

"Organization and Development of the Chemical Section of the American Association for the Advancement of Science," by Marcus Benjamin; read by the secretary.

The next papers were reports from the Census Committee presented in the following order:

"Progress in Organic Chemistry during the Past Twenty-five Years," by Wm. A. Noyes; read in abstract by Charles Baskerville.

"Progress in Opportunities for Advanced Inorganic Work," by Louis M. Dennis; read by title.

"Aims and Opportunities Offered in Physical Chemistry in America," by Louis Kahlenberg; read by title.

"Improved Teaching in Technical Chemistry, and Results Accomplished by the Application of Chemistry to the Arts, in America, since the Founding of the American Chemical Society," by Charles E. Munroe; read by title.

"Progress of Teaching Chemistry in the Schools since the Founding of the American Chemical Society," by Rufus P. Williams; read by title.

"Report of the Work of the Census Committee," by Charles Baskerville, chairman; presented in abstract.

These various reports were received by the Society and referred back to the committees presenting them for co-ordination, completion, and subsequent reference to the Committee on Papers and Publications.

The secretary presented to the Society the following named persons as nominees for honorary membership, stating that the requirements of the constitution regarding their nomination had been fully complied with, and moving that the Society proceed to their election: Professor William Ramsay, University College, London, England; Professor Henry E. Roscoe, vice-chancellor University of London, England; Professor Emil Fischer, Berlin, Germany; Professor Adolph von Baeyer, Munich, Germany; Professor George Lunge, Zürich, Switzerland. The motion was duly seconded and the gentlemen named were unanimously elected honorary members of the American Chemical Society.

After some announcements by the secretary and the local committee the afternoon session was adjourned.

The evening session of the Society was called to order in the Assembly Hall of the Chemists' Club at 8:45 P.M. by President F. W. Clarke. An address upon the "Dignity of Chemistry" was presented by Harvey W. Wiley, and this was followed by an historical address upon "The Formation of the American Chemical Society," by Chas. F. Chandler.

Upon the motion of Edward W. Morley the thanks of the Society were unanimously voted to the New York Section of the American Chemical Society; to the Local Committee of Arrangements; to the trustees of the Chemists' Club; to the chairman of the New York Local Section and to the president of the Chemists' Club for their cordial words of welcome; and to the officers and managers of the various institutions and works for the invitations extended to the chemists to visit them.

After some announcements, the formal sessions of the twenty-fifth anniversary were adjourned, and the chemists, upon the invitation of the New York Section, remained for a social reunion

at the rooms of the Chemists' Club where refreshments were provided by the Committee of Arrangements.

Upon the adjournment of the afternoon session, the Council met in the Assembly Hall of the Chemists' Club, and after the transaction of considerable business, adjourned to meet at the Chemists' Club at 9 A.M. the next day. At this adjourned meeting on Saturday, April 13th, in addition to other business transacted by the Council, it was voted that the Committee on Papers and Publications be directed to publish the proceedings, papers and all matter of report pertaining to the anniversary meeting, in a separate volume; and the directors were authorized to appropriate the sum of $500, or so much thereof as might be found necessary, to cover the expense of completing and publishing such proceedings.

At the meeting of the Board of Directors, held Saturday, April 13th, immediately after the adjournment of the Council, the sum of $500 was appropriated as recommended by the Council to cover the expense of compiling and publishing the proceedings of the twenty-fifth anniversary of the Society.

The plans of the Committee of Arrangements for Saturday, April 13th, included various visits and excursions during the day, and in the evening a subscription dinner at Hotel Savoy, 59th street and Fifth Avenue.

The general excursions were three in number as follows:

1. By train at foot of Liberty Street at 8.30 A.M. to the Guggenheim Smelting Works, Perth Amboy, N. J., thence to the Tide Water Oil Company, Bayonne, N. J., and from there to the Pacific Coast Borax Company.

2. Visit the Carl H. Schultz Mineral Water Establishment, foot of 26th Street, at 9 A.M., thence by special boat, provided by the American White Lead Works, at 10.15 A.M, sail down the East River and New York Bay to Staten Island to the lead works of the company, and from there to Nixon's Ship Yard, returning in the afternoon.

3. Visit the Copper Mines, Arlington, N. J., leaving foot of Chambers Street at 9.45 A.M.

The festivities at Hotel Savoy on the evening of April 13th very fittingly terminated the celebration of the twenty-fifth anniversary. A fac-simile of the menu on that occasion and the toast-list at the banquet are herewith given:

MENU.

Huîtres Cape Cod.

Crême d'asperges, Pastrana.

Bouchées de volaille à la Reine.

Alose planchée, Vénitienne.
Concombres.

Agneau du printemps, Aromatique.
Haricots verts panachées. Pommes fondantes.

Poitrine de chapon braisé, Toulouse.
Céleri au velouté.

Sorbet au Kirsch.

Canard de mallard, maïs frit.
Salade de saison.

Glaces de fantaisies.
Petits fours. Fruits.
Café.

American Chemical Society,
New York.

Hotel Savoy
Samedi, le 13 Avril, 1901.

BANQUET IN CELEBRATION OF THE TWENTY-FIFTH ANNIVERSARY OF THE AMERICAN CHEMICAL SOCIETY.

1876–1901.

TOASTS.

PROLOGUE, - - CHAIRMAN N. Y. SECTION, C. A. DOREMUS.

"The truly insulated individual can effect little or nothing by his unassisted efforts. It is from minds nourishing their strength in solitude, and exerting that strength in society that the most important truths have proceeded."—*Davy.*

THE AMERICAN CHEMICAL SOCIETY, - PRESIDENT F. W. CLARKE.

"I hardly know which we ought most to rejoice at—the progress that has been made in natural knowledge or the progress that is to be made."—*Davy.*

WHAT WE CELEBRATE, - - - - WM. MCMURTRIE.

"Success and prosperity to the American Chemical Society.—*Sir Wm. Crookes.*"

OUR FOREIGN RELATIONS, - - - - J. W. MALLET.

"The Book of Nature! Shall not we chemists and all our brother students, whether they be naturalists, astronomers, mathematicians, geologists, shall we not all humbly and earnestly read it? Nature, the mother of us all, has inscribed her unfading, her eternal record on the canopy of the skies, she has put it all around us in the platform of the earth."—*Draper.*

OUR ALLIES, - - - - - J. JAMES R. CROES.

"I am sick to death of teaching and will be ruined if this continues."—*Liebig*.

"Our colleges must separate themselves from the mediaeval and assume thoroughly and sincerely the modern cast."—*Draper*.

OUR HIGHER EDUCATION, - - - CHANCELLOR MACCRACKEN.

"The earth which bears us, the air we breathe, the elements which you delighted to interrogate and which were so lovingly responsive, will ever remind us of you."
—*Pasteur*.

"The dead are also there. From those silent sepulchres which are within the brain, they rise again as living things, and people the scenes they once loved."
—*Draper*.

OUR ADVANCE GUARD, - - - - - A SILENT TOAST.

"Everybody knows that this inquiry, undertaken from purely scientific motives, led to the discovery of two compounds now in continual use for the diminution of human suffering. What an illustration of the practical advantages ever flowing from the pursuit of science, even when apparently most abstract!"—*Hofmann*.

AMERICAN CHEMICAL RESEARCH, - - - E. W. MORLEY.

"For fourteen days I have not been well. Not knowing what to do, I examined malic acid."—*Liebig*.

REPAIR SHOP SUPPLIES, - - - - WM. J. SCHIEFFELIN.

"Hydrogen in many of its relations, acts as though it were a metal; could it be obtained in a liquid or solid condition, the doubt might be settled."—*Faraday*.

"Science, for its progression, requires patronage; but it must be a patronage bestowed, a patronage received with dignity."—*Davy*.

THE NATIONAL ACADEMY AS A PROMOTER OF RESEARCH,

IRA REMSEN.

"Science has been a prime cause of creating for us the inexhaustible wealth of manufactures; and it is by science that it must be preserved and extended."—*Davy*.

OUR CHEMICAL INDUSTRIES, - - - - C. F. CHANDLER.

"It is only of late years that we are beginning to recognize his (the sun's) agency as the author of organization and life, who lays up with an almost provident foresight in vegetable productions, stores of light and heat for the use of the animal world."—*Draper*.

GOOD FOOD, - - - - - - H. W. WILEY.

"Filling this bag with the mixed gases and blowing some soap bubbles, so as to confine the gases in nothing, thus to speak, I now apply a lighted taper to the bubbles, and observe, the result is a violent explosion * * * and water, *nothing but water*." * * *

"And now let us ponder for an instant on the leading qualities, the *points* of water."—*Faraday*.

GOOD DRINK, - - - - - - WM. P. MASON.

Hotel Savoy,
April 13, 1901.

CHEMICAL SOCIETIES OF THE XIX CENTURY.

BY HENRY CARRINGTON BOLTON.

The beginning of a new century affords an opportune period for chronicling the progress of chemistry as shown by the organizations formed to foster its study and to stimulate its adherents. In the following pages an attempt has been made to place on record the statistics of the Chemical Societies of the World for the year 1900, and to indicate those that ended their careers within the nineteenth century. The data have been obtained chiefly by correspondence, and thanks are due to the officers of societies who have responded to inquiries. I am also under special obligations to Dr. Paul Dorveaux, Librarian of the École Supérieure de Pharmacie, Paris ; to Professor Bohuslav Brauner, of the Bohemian University, Prague; to Professor Georg W. A. Kahlbaum, of the University of Basel ; and particularly to the Smithsonian Institution, for aid in securing the information sought.

The fact that chemical societies were organized and in operation in the United States of America long before they existed in Europe has been shown in my paper, "Early American Chemical Societies," read to the Chemical Society of Washington, April 8, 1897. The two pioneers in this field were the "Chemical Society of Philadelphia," founded in 1792, and the "Columbian Chemical Society of Philadelphia," founded in 1811. Of these some particulars will be found in their proper order.

In the following list the societies are placed in chronological order under each country, and the countries are arranged alphabetically. Of each society the following data are given so far as attainable :

Seat, and date of founding,
Name of President, and membership in 1900,[1]
Serial publications,[2]
Remarks.

The results of this census are given in the following Table :

[1] No deductions have been made for duplication.

[2] For full details consult : "A Select Bibliography of Chemistry," by Henry Carrington Bolton, Washington, 1893–1899. 3 vols. 8vo.

CHEMICAL SOCIETIES OF THE WORLD.

MEMBERSHIP IN 1900.

Country.	No. of societies.	No. of members.
Austria	8	2,972
Belgium	3	740
Denmark	1	113
France	11	4,077
Germany	15	7,431
Great Britain	10	7,750
Italy	4	599
Japan	2	1,012
Russia	1	327
South Africa	1	(?)
Switzerland	2	94
United States of America	7	2,575
Victoria	1	100
Totals	66	27,790

March, 1901,
WASHINGTON, D. C.

AUSTRIA.

CENTRALVEREIN FÜR RÜBENZUCKER INDUSTRIE IN DER OESTERREICHISCH-UNGARISCHEN MONARCHIE.

Founded in 1854 at Vienna. In 1900: President, August Freiherr von Stummer; members, 213; associates, 49.

Publications: Organ des Vereins für R.-I., 1863–1874; Organ des Centralvereins für R.-I., 1875–1887. Oesterreichisch-ungarische Zeitschrift für Zucker-Industrie und Landwirthschaft, 1888–1900. (Beilagen): Der Marktbericht, 1874–1885; Wochenschrift des Centralvereins für Rübenzucker in der oesterreichisch-ungarischen Monarchie, 1886–1900.

NOTE.—The Society maintains a Chemical Experiment Station under the direction of E. Stohmer.

VEREIN ZUR HEBUNG DER ZUCKERFABRIKATION IM KÖNIGREICH BÖHMEN. [Also with a Bohemian name.]

Founded in 1868 at Prag under the presidency of Ferdinand Urbánek; the languages used were Bohemian and German. It was disbanded in 1874.

Publication: Zeitschrift für Zucker-Industrie. Organ des Vereins. Prag. 3 vols., 1872–74.

NOTE.—This journal is not to be confounded with: Zeitschrift für Zucker-Industrie in Böhmen, established at Prag in 1877 and current.

CHEMICKA SPOLEČNOST : SPOLEK ČESKÝCH CHEMIKŮ. [Chemical Society : Union of Bohemian Chemists.]

Founded in 1872 at Prag. In 1900: President, K. Preis; honorary members, 11 ; active members, 318 ; correspondents, 77.

Publications : Zprávy spolku českých chemiků. 2 vols., 1872–76. (Reports.) Listy Chemické, 1877–1900. (Letters.)

NOTE.—The Society has also published a Chemická Knihovna (Chemical Library) in 8 vols.

ZEMSKY SPOLEK PRO PRŮMYSL CUKROVARNICKÝ V ČECHÁCH ; VEREIN DER ZUCKERINDUSTRIE IM KÖNIGREICH BÖHMEN.

Founded in 1876 at Prag. In 1900: President, Gustav Hodek; members, 325.

Publications : Zeitschrift für Zucker-Industrie in Böhmen, 1877–1900. (Beilage) : Prager Zuckermarkt, 1881–1900.

OESTERREICHISCHE GESELLSCHAFT ZUR FÖRDERUNG DER CHEMISCHEN INDUSTRIE.

Founded in 1878 at Prag. In 1900 : President, Georg Zetter ; honorary members, 3 ; members, 196.

Publications: Bericht der oesterreichischen Gesellschaft zur Förderung der chemischen Industrie, 1879–98. Since 1899 the organ of the Society is : Oesterreichische Chemiker-Zeitung.

SPOLEČNOST PRO PRŮMYSL CHEMICKÝ. [Society of Chemical Industry.]

Founded in 1892 at Prag. In 1900 : President, J. B. Lambl ; honorary members, 20; active members, 440; correspondents, 54; founders, 57.

Publications : The organ of the Society since 1892 is : Časopis pro průmysl chemický, of Prag, which had been established in 1891. The Society has also published three volumes of a technological library : Knihovna technologicko chemická.

WIENER VEREIN ZUR FÖRDERUNG DES PHYSIKALISCHEN UND CHEMISCHEN UNTERRICHTS.

Founded in 1895 at Vienna. In 1900 : President, Victor von Lang ; members, 317.

Publication : Vierteljahresberichte der Wiener Verein zur Förderung des physikalischen und chemischen Unterrichts, 1895–1900.

VEREIN OESTERREICHISCHER CHEMIKER IN WIEN.

Founded in 1897 at Vienna. In 1900 : President, J. Klaudy ; members, 878 ; founders, 14.

Publication : Oesterreichische Chemiker-Zeitung, 1898–1900.

BELGIUM.

ASSOCIATION BELGE DES CHIMISTES.

Founded August 4, 1887, at Brussels. In 1900 : President, L. L. de Koninck; honorary members, 4 ; active members, 482 ; associates, 21 ; correspondents, 8.

Publication: Bulletin de l'Association Belge des Chimistes, 1887–1900.

NOTE.—The association has 8 sections, *viz :* Liége, Louvain, Gembloux, Charleroi, Mons, Gans, Antwerp, Brussels.

SOCIÉTÉ TECHNIQUE ET CHIMIQUE DE SUCRERIE DE BELGIQUE.

Founded February 26, 1896, at Brussels. In 1900: President, Eugène Meeus ; members, 173 ; patron, 1.

Publications : La sucrerie Belge, which was established August 31, 1872, has been the organ of the Society since its foundation. The Society has also published several pamphlets on technical topics.

NOTE.—The formation of Sections was under discussion in 1900.

SYNDICAT DES CHIMISTES PUBLICS DE BELGIQUE.

Founded in 1897 at Brussels. In 1900 : President, François Sachs ; members, 51.

Publication : Bulletin du Syndicat des chimistes publics de Belgique, 1897–1900.

NOTE.—The Society has in preparation : Recueil générale des méthodes d'analyse usitée dans les laboratoires publics.

SOCIÉTÉ GÉNÉRALE DES FABRICANTS DE SUCRE DE BELGIQUE is not a chemical society ; its organ is: La sucrerie Belge, 1872–1900.

DENMARK.

DANISH CHEMICAL SOCIETY.

Founded in 1879 at Copenhagen. In 1900 : President, S. M. Jörgensen ; members, 113.

NOTE.—The Danish Society publishes no journal.

FRANCE.

Société d'Arcueil.

Founded in 1807 at Arcueil. Dissolved in 1822. Members (at any one time), 12.

Publication: Mémoires de physique et de chimie. Paris, 3 vols., 8vo. 1807–17.

Note.—This private organization was founded by C. L. Berthollet; the meetings were held at his country house in Arcueil, near Paris. The membership included: La Place, C. L. Berthollet and his son A. B. Berthollet, Biot, Gay-Lussac, Humboldt, Thénard, Decandolle, Collet-Descotils, Berard, Chaptal, Dulong, Poisson, Malus.

Société industrielle de Mulhouse.

Founded in December, 1825, at Mulhouse (first meeting, May 11, 1826). In 1900: President, Auguste Dollfus; honorary members, 9; resident members, 190; non-resident members, 378; correspondents, 54.

Publication: Bulletin de la Société industrielle de Mulhausen (*sic*), 1827–1900.

Note.—This is not purely a chemical society, but it has a committee on chemistry, and its Bulletin contains many papers on applied chemistry.

Société chimique de Paris.

Founded June 4, 1857, at Paris. In 1900: President, Edouard Grimaux; members, 365; patrons, 121; life members, 91; corresponding members, 449.

Publications: (*a*) Bulletin des séances de la Société chimique de Paris, 1858-62; (*b*) Répertoire de chimie pure et appliquée, 1858–63; (*c*) Bulletin de la Société chimique de Paris, 1864–1900; (*d*) Conférences et Leçons, 5 vols.

Association des élèves de M. Fremy.

Founded in 1878 at Paris. In 1900: President, Louis Barthélemy; members, 200.

Publication: Bulletin trimestriel de l'Association des élèves de M. Fremy, 1878 1900.

Note.—A social organization which, however, publishes the work of its members.

ASSOCIATION DES CHIMISTES DE SUCRERIE ET DE DISTILLERIE DE FRANCE ET DES COLONIES.

Founded in 1883 at Paris. In 1900 : President, M. Durin ; honorary members, 3; resident members, 160; non-resident members, 710 ; corresponding members, 395.

Publication: Bulletin de l'Association des chimistes de sucrerie et de distillerie de France et des Colonies, 1883–1900.

ASSOCIATION AMICALE DES ANCIENS ÉLÈVES DE L'ÉCOLE DE PHYSIQUE ET DE CHIMIE INDUSTRIELLE DE LA VILLE DE PARIS.

Founded in 1885 at Paris. In 1900: President, Octave Boudouard ; honorary members, 41 ; members, 300.

Publication : Bulletin mensuel de l'Association amicale des anciens élèves de l'École de physique et de chimie industrielle de la ville de Paris, 1885–1900. Annuaire [etc.], 1885–1900.

ASSOCIATION AMICALE DES ANCIENS ÉLÈVES DE L'ÉCOLE DE CHIMIE INDUSTRIELLE DE L'LYON.

Founded in 1886 at the Institut chimique de Lyon. In 1900 : President, Alphonse Seyewitz ; honorary members, 6 ; members, 104.

Publication: Bulletin des séances de l'Association amicale des anciens élèves de l'École de chimie industrielle de Lyon.

SYNDICAT CENTRAL DES CHIMISTES ET ESSAYEURS DE FRANCE.

Founded in 1890 at Paris. In 1900 : President, Ferdinand Jean ; members, 125.

Publications : Revue de chimie analytique appliquée à l'industrie, 1893–98. Annales de chimie analytique appliquée à l'industrie, became the organ of the Society in 1899; the Annales had been established in 1896, and was united with the Revue (above named) in 1899.

SOCIÉTÉ CHIMIQUE DU NORD DE LA FRANCE.

Founded at Lille in 1891. In 1900 : President, A. Pouriez ; members, 100.

Publication : Bulletin mensuel de la Société chimique du Nord de la France, 1891–1900.

ASSOCIATION AMICALE DES ANCIENS ÉLÈVES DE L'INSTITUT CHIMIQUE DE NANCY.

Founded November 9, 1892, at Nancy. In 1900 : President,

M. Noel ; honorary members, 8 ; patrons, 7 ; members, 52 ; associates, 75.

Publication : Bulletin (annuel) de l'Association.

ASSOCIATION AMICALE DES ÉLÈVES ET ANCIENS ÉLÈVES DU LABORATOIRE D'ENSEIGNMENT PRATIQUE APPLIQUÉE DE L'UNIVERSITÉ DE PARIS.

Founded in 1897 at Paris. In 1900 : President, M. Loyer ; honorary members, 12 ; members, 110.

Publication : Gazette de chimie, Paris, 1900.

GERMANY.

VEREIN FÜR DIE RÜBENZUCKER INDUSTRIE IM ZOLLVEREIN [later, DES DEUTSCHEN REICHS ; later, VEREIN DER DEUTSCHEN ZUCKERINDUSTRIE].

Founded in 1850 at Berlin. In 1900 : President, De Coste ; members, 447.

Publication : Zeitschrift des Vereins [etc.], 1850–1900.

DEUTSCHE CHEMISCHE GESELLSCHAFT ZU BERLIN.

Founded in 1867 at Berlin. In 1900 : President, G. Volhard ; honorary members, 15 ; life members, 92 ; members, 2,637 ; associates, 372.

Publication : Berichte der deutschen chemischen Gesellschaft zu Berlin, 1868–1900. Since 1897 also : Chemisches Centralblatt (established in 1830).

CHEMISCHE GESELLSCHAFT ZU FRANKFURT-AM-MAIN.

Founded in 1869 at Frankfurt.

Publication : Berichte der chemischen Gesellschaft zu Frankfurt-am-Main für die Jahre 1869–1880. Frankfurt-a-M., 1881.

CHEMISCHE GESELLSCHAFT ZU WÜRZBURG.

Founded in 1872.

Publication: Bericht über die Thätigkeit der chemischen Gesellschaft zu Würzburg, 1872–85 [+ ?].

VEREIN ANALYTISCHER CHEMIKER.

Founded in 1878 at Magdeburg, and merged in 1887 with the Deutsche Gesellschaft für angewandte Chemie. *See* Verein deutscher Chemiker.

Publication: Correspondenzblatt des Vereines analytischer Chemiker, 1878–80.

FREIE VEREINIGUNG BAYERISCHER VERTRETER DER ANGEWANDTEN CHEMIE.

Founded in May, 1883, at Munich. In 1900 : President, Albert Hilger ; honorary members, 2 ; members, 124 ; correspondents, 69.

Publications : Bericht über die 1 [–18] Versammlung der freien Vereinigung bayerischer Vertreter der angewandten Chemie, 1883–1900. Also reports in : Forschungsberichte über Lebensmittel und ihre Beziehung zur Hygiene, 1894–97; and in: Zeitschrift für Untersuchung der Nahrungs- und Genuss-Mittel, 1898–1900.

VEREIN DEUTSCHER BERUFS-CHEMIKER.

Founded in 1887 at Dresden.

Publication: The "Chemiker und Droguist" (Dresden, 1885) had in 1887 the sub-title: Correspondenzblatt des Vereines deutscher Berufs Chemiker. This title was dropped in 1888.

DEUTSCHE GESELLSCHAFT FÜR ANGEWANDTE CHEMIE.

Founded November, 1887, at Berlin, absorbing the Verein analytischer Chemiker. In 1896 the Society became : Verein deutscher Chemiker, *q. v.*

Publication : Zeitschrift für angewandte Chemie, 1888–1900. This was begun as : Zeitschrift für die chemische Industrie in 1887.

VEREINIGUNG ÖFFENTLICHER ANALYTISCHER CHEMIKER SACHSENS.

Founded in 1890 at Plauen in Vogtland. In 1900: President, Arthur Forster ; members, about 25.

Publication : Zeitschrift für öffentliche Chemie, 1897–1900. Also : Bericht über die Hauptversammlung des Vereines öffentlicher analytischer Chemiker Sachsens.

VEREIN AKADEMISCH-GEBILDETE [later, DEUTSCHER] ZUCKERTECHNIKER.

Founded in 1891 at Berlin. In 1900 : President, H. Claassen; honorary members, 1 ; members, 406 ; correspondents, 3.

Publication : Zeitschrift des Vereins akademisch-gebildete Zuckertechniker, 1891–92.

NOTE.—The organ of publication changed several times.

VERBAND DES LABORATORIUMS-VORSTÄNDE VON DEUTSCHEN HOCHSCHULEN.

Founded in 1898 [?].

ZWEIGVEREIN DER ZUCKERTECHNIKER FÜR DAS AUSLAND.

Founded at Berlin. In 1901 : President, C. Huck.

DEUTSCHE ELEKTROCHEMISCHE GESELLSCHAFT.

Founded in October, 1894, at Berlin. In 1900 : President, J. H. van't Hoff ; members, about 700.

Publication : Bericht der deutschen elektrochemischen Gesellschaft, 1894–1900.

VEREIN DEUTSCHER CHEMIKER.

Founded in 1896 at Berlin, as successor to Gesellschaft für angewandte Chemie (1887). Its seat is the residence of the President for a given year. In 1900 : President, H. Caro ; honorary members, 4 ; members, 2,271. Embraced in 1900 the following sections (Bezirk-Vereine) : Aachen, Belgien, Berlin, Frankfurt, Hamburg, Hannover, Mittel-Franken, Mittel- und Niederschlesien, Oberrhein, Oberschlesien, Pommern, Rheinland, Rheinland-Westphalen, Saar, Sachsen-Anhalt, Sachsen-Thüringen, Württemberg.

Publication : Zeitschrift für angewandte Chemie, 1887–1900. *Cf.* Deutsche Gesellschaft für angewandte Chemie.

VERBAND SELBSTÄNDIGER ÖFFENTLICHER CHEMIKER DEUTSCHLANDS.

Founded May 30, 1896, at Nürnberg. In 1900 : President, Robert Kayser ; members, 161 ; associates, 102.

Publication: Zeitschrift für öffentliche Chemie (established in 1895), 1897–1900. Also Vol. I. as Vol. III., 1897, of Centralblatt für Nahrungs- und Genussmittel Chemie, sowie Hygiene.

GREAT BRITAIN.

SOCIETY FOR PHILOSOPHICAL EXPERIMENTS.

Founded in 1794 at London.

Publication : Minutes of the Society for Philosophical Experiments, 1794.

NOTE.—A German translation of the *Minutes* was edited by Alex. Nic. Scherer and published at Halle in 1803.

CHEMICAL SECTION OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Founded in 1831. This is, however, a corporate part of the

British Association, and the papers read to the Section are published in the annual Reports of the British Association, 1831–1900. In 1900: President, W. H. Perkin, jun.; number of members not given.

Chemical Society of London.

Founded in 1841 at London. In 1900: President, T. E. Thorpe; honorary and foreign members, 33; members, 2,300.

Publications: Memoirs and Proceedings of the Chemical Society of London (1841–48); Quarterly Journal, 1849–62; Journal of the Chemical Society, 1863–1900.

Newcastle-upon-Tyne Chemical Society.

Founded in 1868 at Newcastle-upon-Tyne. Discontinued in 1882.

Publication: Transactions of the Newcastle-upon-Tyne Chemical Society, 1868–82.

Society of Public Analysts.

Founded in 1874 at London. In 1900: President, Walter W. Fisher; honorary members, 9; members, 260.

Publication: Proceedings of the Society of Public Analysts, 1876; The Analyst, 1877–1900.

Institute of Chemistry of Great Britain and Ireland.

Founded October, 1887, in London; incorporated 1885. In 1900: President, John Miller Thomson; members, fellows, and associates, 1,008 (resident members, 904); students, 118. Total, 1,126.

Publications: Proceedings, half yearly, 1878–1900; Register, yearly, 1878–1900; Regulations, yearly, 1878–1900.

Society of Chemical Industry.

Founded in 1881 at London. In 1900: President, Charles F. Chandler; honorary member, 1 (John Glover); members, 3,459.

Publication: Journal of the Society of Chemical Industry, 1882–1900.

Note.—The Society has eight sections: London, Liverpool, Manchester, Newcastle, New York, Nottingham, Scotland, and Yorkshire.

Society of Dyers and Colourists.

Founded in 1884 at Bradford. In 1900: President, H. Grandage; honorary members, 3; members, 553.

Publication: Journal of the Society of Dyers and Colourists, 1884–1900.

Alembic Club.

Founded in 1899 at Edinburgh. This is a private club of only six members and has no president; the Secretary is Leonard Dobbin.

Publishes no journal, but has issued 15 Reprints of Chemical Monographs, etc., 1893–1900, and other works.

International Association of Leather-Trades Chemists.

Founded September, 1897, at London. In 1900: President, H. R. Proctor; number of members, ——.

Publication: Report of the Proceedings of the Conference of Leather-Trades Chemists, 1897.

ITALY.

Associazione chimico-farmaceutica fiorentina.

Founded in 1877 at Florence. In 1900: honorary members, 20; resident members, 100.

Publication: L'Orosi, Bollettino di chimica, farmacia e scienze affini. Firenze, 1878–1900.

Società chimica di Milano.

Founded in February, 1895, at Milan. In 1900: President, Angelo Menozzi; resident members, 152; correspondents, 133.

Publication: Annuario della Società chimica di Milano, 1896–1900.

Associazione chimico-industriale di Torino.

Founded June 25, 1899, at Turin. In 1900: President, Vittorio Sclopis; honorary members, 4; resident members, 103; correspondents, 87.

Publication: La Chimica Industriale, 1899–1900.

Società italiana dei chimici analisti.

Founded in 1893 at Pavia.

Publication: Atti ufficiale delle Società italiana dei chimici analisti, 1893. This forms a pamphlet of 18 pp. only, and is perhaps a mere prospectus, as the Society ceased to exist before 1900.

JAPAN.

Chemical Society of Tokyo.

Founded April, 1878, at Tokyo. In 1900: President, Naokichi Matsui ; number of members, 156 ; associates, 197.

Publication: Tokyo Kagakkai Kaishi, 1880–1900.

Society of Chemical Industry of Japan.

Founded February, 1898, at Tokyo. In 1900 : President, Takeaki Enomoto ; honorary members, 7 ; members, 223 , associates, 429.

Publication : Kōgyō Kagaku Zasshi, 1898–1900.

RUSSIA.

Russkago Khimicheskago Obshtchestva [Russian Chemical Society].

Founded October 26, 1868. The Chairman of the first meeting was D. Mendeléeff. In 1900 : President, F. F. Petrushevsky ; members, 327.

Publications : Zhurnal Russkago Khimicheskago Obshtchestva. St. Petersburg, 1869–72, 4 vols.

Continued as :

Zhurnal Russkago Khimicheskago Obshtchestva i Fisicheskago Obshtchestva, 1873–78. 6 vols.

Continued as :

Zhurnal Russkago Fisiko-Khimicheskago Obshtchestva, 1879–1900.

SOUTH AFRICA.

Chemical and Metallurgical Society of South Africa.

Founded May, 1894, at Johannesburg.

Publication : Proceedings of the Chemical and Metallurgical Society of South Africa, 1894–1897.

SWITZERLAND.

Société chimique de Genève.

Founded February 10, 1878, at Geneva. In 1900: President, F. Kehrmann.

Publication: The Minutes of the monthly meetings are published in : Archives des sciences physiques et naturelles de Genève, and in the Chemiker-Zeitung.

Verein schweizerischer analytischer Chemiker.

Founded March 12, 1887, at Zürich. In 1900 : President, A. Bertschinger ; number of members, 94.

Publication : The organ of the Society is Schweizerische Wochenschrift für Chemie und Pharmacie, which was established under the title, Schweizerische Zeitschrift für Pharmacie, 1856–62.

UNITED STATES OF AMERICA.

Chemical Society of Philadelphia.

Founded in 1792 at Philadelphia, under the presidency of James Woodhouse. Number of members not known. The Society was in existence for more than ten years.

Publication : Memoir on the Supply and Application of the Blowpipe [etc.], by Robert Hare, 1802.

Columbian Chemical Society of Philadelphia.

Founded August, 1811, at Philadelphia, under the presidency of James Cutbush. Honorary members, 69; junior members, 13.

Publication : Memoirs of the Columbian Chemical Society of Philadelphia. Vol. I., 1813.

Chemical Section of the American Association for the Advancement of Science.

A migratory organization, founded in 1875 as a Sub-Section ; it became Section C of the A. A. A. S. in 1882 at the second meeting in Montreal. In 1900 : Chairman of the Section, Jas. Lewis Howe ; members, 89 ; fellows, 181.

Publications : The Proceedings of the A. A. A. S. has a division containing papers read before the Section of Chemistry.

American Chemical Society.

Founded April 20, 1876, in New York City. In 1900 : President, William McMurtrie ; honorary members, 10 ; members, 1,546 ; associates, 123.

Publications : Proceedings of the American Chemical Society, 1877–78 ; Journal of the American Chemical Society, 1879–1900.

Note.—In 1900 the Society had 12 sections : Rhode Island, Cincinnati, New York, Washington, Lehigh Valley, Chicago, Nebraska, North Carolina, Columbus, North Eastern, Philadelphia, and Michigan.

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS.

Founded September 8, 1884, at Philadelphia. In 1900: President, B. W. Kilgore; members, 350.

Publications: Methods of Analyses, 1884–88; Proceedings, 1889–1900.

NOTE.—Conventions of the Official Agricultural Chemists had been held prior to 1884; in 1880 at Washington and Boston; in 1881 at Cincinnati; and in May, 1884, at Atlanta.

CHEMICAL SOCIETY OF WASHINGTON.

Founded at Washington in 1884. In 1893 became the Washington Section of the American Chemical Society, retaining also its name as above. In 1900: President, H. Carrington Bolton; members, 114.

Publication: Bulletin of the Chemical Society of Washington, 1884–92.

NEW ENGLAND ASSOCIATION OF CHEMISTRY TEACHERS.

Founded February 19, 1898. Meetings are held in New England. In 1900: President, Rufus P. Williams; honorary members, 8; active members, 50; associates, 22.

Publications: Circulars of Information and Reports, 1898–1900. Also Registers.

VICTORIA.

SOCIETY OF CHEMICAL INDUSTRY OF VICTORIA.

Founded in 1900 under the Presidency of Orme Masson; membership, about 100

The foregoing list does not include Academies of science nor Associations of general science (with a few exceptions); it does not embrace societies having for their object industries involving chemical processes in part, excepting the refining of sugar; nor does it include the numerous societies of brewers and of beer-making, among which may be named the following:

BRAU-INDUSTRIE VEREIN IM KÖNIGREICH BÖHMEN, founded at Prague in 1874, and publishing the Böhmische Bierbrauer.

DEUTSCHE BRAUERBUND, founded at Nürnberg in 1861, and publishing the Allgemeine Hopfen-Zeitung.

WÜRTTEMBERGISCHE BRAUERBUND, founded at Waldsee in 1872, and publishing the Schwäbische Bierbrauer.

BADISCHE BRAUERBUND, founded at Nürnberg in 1876, and publishing the Hopfenlaube.

DEUTSCHE BRAUMEISTER VEREIN, founded at Berlin, 1887, and publishing the Deutsche Brau-Industrie.

ASSOCIATION GÉNÉRALE DES BRASSEURS BELGES, founded at Brussels in 1874, and publishing Revue des Bières.

COUNTY BREWERS' SOCIETY, England, publishing since 1871 the Brewers' Guardian.

HISTORY OF THE AMERICAN CHEMICAL SOCIETY.

BY ALBERT C. HALE.

In the columns of *The American Chemist*, for April, 1874, there appeared a communication from Dr. H. Carrington Bolton, of Columbia College, New York City, in which attention was called to the many remarkable discoveries, achievements and publications in chemistry which occurred during the year 1774, just one hundred years previous. Especial mention was made of the discovery of oxygen by Dr. Joseph Priestley, on August 1, 1774, "the immediate results of which were the overthrow of the time-honored phlogistic theory and the foundation of chemistry on its present basis." It was stated that "the year 1774 may well be considered as the starting-point of modern chemistry."

Dr. Bolton suggested, therefore, that it would be "an agreeable event if American chemists should meet on the first day of August, 1874, at some pleasant watering place, to discuss chemical questions, especially the wonderfully rapid progress of chemical science in the last hundred years." This suggestion was endorsed by the editors of *The American Chemist*, who requested that those chemists who were interested in the suggestion should "send their views at once, so that the project could be put into practical form in time."

Letters heartily endorsing the project were received from several chemists, and among them one from Miss Rachel L. Bodley, professor of chemistry in The Woman's Medical College of Pennsylvania, who suggested that the most appropriate spot for the proposed centennial gathering of chemists would be Northumberland, Pa., where Dr. Priestley spent the last years of his life and was buried, and where might be seen the apparatus devised by the great scientist and used in his memorable experiments. A great-grandson of the celebrated chemist—Dr. Joseph Priestley, a practicing physician—was still living in Northumberland; the old Priestley house occupied by the great discoverer of oxygen was still standing there, as well as the quaint little church built by him; and nothing could be more appropriate than a reunion of the chemists of America around the grave of this renowned discoverer.

At a meeting of the chemical section of the New York Lyceum of Natural History, May 11, 1874, the proposed celebration was brought up by Dr. Bolton, and a committee of five was appointed "to correspond with the chemists of the country with a view to secure the observance of a centennial anniversary of chemistry during the year 1874." The committee consisted of Dr. H. C. Bolton, Professor C. F. Chandler, Professor Henry Wurtz, Professor Albert R. Leeds, and Professor Charles A. Seely. The suggestion of Professor Bodley to hold the meeting at Northumberland met with general acceptance, and it was decided that the centennial celebration should occur there on July 31 and August 1, 1874.

The celebration was accordingly held at the time and place decided upon, and brought together probably the most notable assemblage of chemists that had ever convened upon the American continent. The meeting was called to order at 9 A.M., July 31, in the lecture room of the public school building of Northumberland. Professor Charles F. Chandler, of the School of Mines, Columbia College, New York, was chosen president, and was supported by a large number of eminent American chemists, who were elected vice-presidents. Fitting addresses and reviews of the progress of chemistry were presented; congratulatory messages were exchanged by cable with the English chemists at Birmingham, England, who on the following day were to unveil a statue in honor of Priestley; a number of Dr. Priestley's letters were read to the assembly; and a memorial address was delivered at the grave of Dr. Priestley by Henry Coppée, LL.D., president of Lehigh University.

During the afternoon session of July 31, a motion was presented by Professor Persifor Frazer, that "a committee of five be appointed by the president, to whom shall be referred the advisability of calling a representative committee of chemists of the United States, to form a chemical society, and all questions relating to the organization of the Society." There being manifest a difference of opinion among those present as to the advisability of taking such action, on motion of Dr. Bolton the following was adopted instead of the motion presented by Professor Frazer: "Resolved, that a committee of five be appointed from this meeting to co-operate with the American Association for the Advancement of Science at their next meeting, to the end of

establishing a chemical section on a firmer basis." The committee appointed consisted of Dr. H. C. Bolton and Professors Silliman, Smith, Horsford, and Hunt.

Within the American Association for the Advancement of Science, the inspiration to special activity among chemists arose, perhaps, from the fact that in 1872 the presiding officer of that association was America's distinguished chemist, Professor J. Lawrence Smith. At the meeting in Portland the following year, a separate heading in the physics section was given for chemistry, and more papers were presented in that science than were read the year before in physics and chemistry both. The group of young and enthusiastic chemists who attended this meeting included quite a number who have since occupied a prominent place among America's representatives in chemical science. To the chemists present at the Portland meeting, the time seemed ripe for a more favorable recognition of the science they represented and, at the close of the sessions, an informal meeting was held by them, Professor S. A. Lattimore acting as chairman, at which resolutions were adopted to be presented to the standing committee at the Hartford meeting in 1874, asking for the organization of a chemical subsection of the association. These resolutions having been favorably considered, the chemists of the association, co-operating with the committee appointed at the Northumberland celebration, August 1, 1874, organized a permanent subsection of chemistry at their meeting in Hartford on the 12th of the same month, in accordance with the provisions of the new constitution of the association adopted that year. This subsection was continued until the year 1882, when a full section of chemistry was established, with Doctor Bolton as its first chairman. This has been one of the most active and efficient sections of the American Association for the Advancement of Science, and by its co-operation with the American Chemical Society during the past few years has done very much to contribute to the success of the meetings of the association and to its general prosperity.

The formation of the subsection of chemistry in the American Association was the first important result of the centennial gathering of chemists at Northumberland. There were, however, many of those present at Northumberland who believed that the full fruition of their hopes would be realized only by the or-

ganization of an independent American Chemical Society, by which alone the closest personal relations could be established between the chemists of America, original research properly stimulated, and the relations of the science to the demands of modern civilization clearly understood and permanently adjusted. Nowhere was this want of an independently organized body of chemists felt more deeply than in the metropolis of the western world. It became more and more impressed upon the chemists of New York City and vicinity that something must be done to meet this want, and at the opening of the year 1876, it seemed that the time was favorable for the organization of a society that should include all classes of chemists who had received the proper chemical training. This idea, at first suggested in informal conversations, led to a meeting held at the home of Professor C. F. Chandler in the city of New York, January 22, 1876, at which the following named persons were constituted a committee to attend to the preliminaries of such an organization: Chas. F. Chandler, W. M. Habirshaw, H. Endemann, M. Alsberg, Henry Morton, Isidor Walz, F. Hoffmann, and P. Casamajor. The following circular was prepared by this committee and mailed to about 100 chemists in New York and vicinity:

"NEW YORK, January 22, 1876.

"DEAR SIR: For some time past many chemists of this city and vicinity have felt the want and deplored the absence of an association, such as exists among other professions, which would lead to a better understanding and a closer acquaintance among its members, in which scientific and practical subjects relating to our special science might be discussed, and means devised in the common interest of the profession. Widely scattered as the chemists in this neighborhood are, such an association would become the center of a pleasant personal intercourse, and of an interchange of views, experiences and researches which would benefit all concerned.

"The undersigned, believing the present an opportune time for establishing a 'Chemical Society' in New York, respectfully invite your co-operation, and would be pleased to receive an early expression of your views upon the subject. As soon as a sufficient number of assenting replies have been received, it is proposed to call a meeting for the purpose of forming a permanent organization."

This circular was signed by the above-named committee. About forty (40) responses were received, giving assurances of

sympathy and co-operation in the undertaking. The interest shown was so gratifying that the committee decided to make an attempt to form a national instead of a local society. A second circular was, therefore, issued and sent to chemists in every part of the country whose names and addresses could be ascertained. The following is a copy of the circular thus issued:

"NEW YORK, March 22, 1876.

"DEAR SIR: Several weeks ago the undersigned issued an invitation to the chemists of this vicinity, requesting their co-operation toward the organization of a *local* Chemical Society. The response was so unexpectedly satisfactory, that on further consultation it was deemed opportune to attempt the formation of a *national* Society, somewhat on the plan of those in such successful operation in France, Germany, and England. It is believed that the existence of such a Society in this country would prove a powerful and healthy stimulus to original research among us, and that it would awaken and develop much talent now wasting in isolation, besides bringing the members of the association into closer union, and ensuring a better appreciation of our science and its students on the part of the general public. Guided by these considerations, we have, in consultation with other members of the profession, drafted the accompanying Constitution and By-laws, which we submit respectfully to your kind consideration.

"Among the objects contemplated are the fitting-up of permanent rooms as the headquarters of the Society, and in connection therewith the establishment of a library of reference, and the gradual collection of a chemical museum. It is also proposed to hold at least one meeting in each year outside of this city, at such a time and in such a place as to make attendance on the part of non-resident members more convenient and representative.

"The proceedings of the Society will be published and sent to the members.

"If these views and objects meet with your approval, please sign and return the postal card enclosed.

"CHAS. F. CHANDLER,
W. M. HABIRSHAW,
H. ENDEMANN,
M. ALSBERG,
HENRY MORTON,
ISIDOR WALZ,
FRED. HOFFMANN,
P. CASAMAJOR."

This circular was accompanied by a draft of a constitution and by-laws, prepared by the committee and modeled largely on the

plan of the German and French societies. Postal cards were also enclosed to be returned with names and addresses of those who wished to join the proposed Society. These were mailed March 28, 1876, and by April 6 sixty (60) chemists outside of New York and vicinity had signified their desire to become members of the new Society. These represented seventeen different states and the District of Columbia.

In conformity with the foregoing circular, the following call was sent out:

"NEW YORK, March 27, 1876.

"DEAR SIR: A meeting for organizing the American Chemical Society will be held on Thursday evening, April 6, 1876, at 8 o'clock P.M., in the lecture room of the College of Pharmacy, University Building, corner Waverly Place and University Place.

"*Your attendance is earnestly requested.*

"CHAS. F. CHANDLER,
W. M. HABIRSHAW,
H. ENDEMANN,
M. ALSBERG,
HENRY MORTON,
ISIDOR WALZ,
FRED. HOFFMANN,
P. CASAMAJOR."

The meeting was held in accordance with this call, with the following named persons in attendance: M. Alsberg, J. P. Battershall, F. M. Baumgarten, H. C. Bolton, A. Bourgougnon, Arno Behr, C. F. Chandler, P. Casamajor, Chas. A. Doremus, F. A. C. Degenhardt, Hermann Endemann, E. P. Eastwick, T. Egleston, Charles Froebel, F. A. Grund, Wm. B. Gifford, W. M. Habirshaw, Fred. Hoffmann, —. Harwick, St. Krackowizer, Fred. Kammerer, O. H. Krause, A. R. Leeds, A. R. Ledoux, L. H. Laudy, Gideon E. Moore, H. E. Niese, W. H. Nichols, Anthony Pirtz, G. A. Prochazka, P. de P. Ricketts, Charles Rice, Charles M. Stillwell, Waldron Shapleigh, and Isidor Walz.

Professor Charles F. Chandler was elected president of the meeting and Isidor Walz secretary. The object of the meeting was then stated by the president and secretary, and after a full and free expression of opinion as to the wisdom of the project a motion to proceed to the organization of a national society was carried with but three dissenting votes. A constitution and by-laws were adopted and permanent officers nominated. The meeting was then adjourned until April 20.

At the adjourned meeting, the organization of the Society was completed, and the following named persons were elected officers for the year 1876:

President—John W. Draper.

Vice-Presidents—J. Lawrence Smith, Frederick A. Genth, E. Hilgard, J. W. Mallet, Charles F. Chandler, and Henry Morton.

Corresponding Secretary—George F. Barker.

Recording Secretary—Isidor Walz.

Treasurer—W. M. Habirshaw.

Librarian—P. Casamajor.

Curators—Edward Sherer, W. H. Nichols, Frederick Hoffmann.

Committee on Papers and Publications—Albert R. Leeds, Hermann Endemann, Elwyn Waller.

Committee on Nominations—E. P. Eastwick, M. Alsberg, S. St. John, Charles Froebel, Charles M. Stillwell.

The Secretary was authorized to print 500 copies of the constitution and by-laws, together with a list of officers and members of the Society. This printed list includes the names of 53 resident members and 80 non-resident; total, 133. The following is a copy of the constitution and by-laws adopted at the organization of the Society, together with the first published list of members:

CONSTITUTION.

ARTICLE I.

This Society shall be styled THE AMERICAN CHEMICAL SOCIETY.

ARTICLE II.

The objects of this Society shall be the encouragement and advancement of chemistry in all its branches.

ARTICLE III.

The Society shall consist of members, associates and honorary members.

ARTICLE IV.

Only chemists shall be eligible as members or honorary members.

ARTICLE V.

The officers of the Society shall consist of a president, six vice-presidents, a corresponding secretary, a recording secretary, a treasurer, a librarian, three curators.

ARTICLE VI.

There shall be

(*a*) A Committee on Nominations, consisting of five members;

(*b*) A Committee on Papers and Publications, consisting of three members.

ARTICLE VII.

The officers of the Society and the chairmen of the committees shall constitute the Council of the Society, and shall have charge of all business not otherwise provided for.

ARTICLE VIII.

The annual meeting for the election of officers and committees shall be held in the month of December of each year, and a majority vote of the members present shall be necessary for an election.

ARTICLE IX.

The headquarters of the Society shall be in the city of New York, and fifteen members shall constitute a quorum.

ARTICLE X.

Amendments to the constitution shall be recommended by the Council of the Society, and for their adoption at the next regular meeting a two-thirds vote of the members present shall be necessary.

BY-LAWS.

ARTICLE I.

The regular meetings of the Society shall be held on the first Thursday of every month.

ARTICLE II.

The order of business at the regular meetings of the Society shall be as follows:

1. Reading of the minutes of the last meeting.
2. Reports of the Council and committees.
3. Election of new members.
4. Nominations of new members.
5. Reading of papers, and discussion.
6. Announcement of papers to be read at the next meeting.
7. Miscellaneous business.
8. Adjournment.

ARTICLE III.

The order of business at the annual meeeting shall be as follows:

1. Reading of the minutes of the last meeting.
2. Report of the president on the state of the society.
3. Report of the Council.
4. Reports of the treasurer, librarian and curators.
5. Reports of committees.
6. Election of officers and committees.
7. Miscellaneous business.
8. Election of new members.
9. Nominations of new members.
10. Reading of papers, and discussion.
11. Announcement of papers for the next meeting.
12. Adjournment.

ARTICLE IV.

The order of business at the regular meetings may be suspended for one evening with the consent of three-fourths of the members present.

ARTICLE V.

Members residing within a radius of thirty miles from New York shall be resident members.

ARTICLE VI.

Resident members shall pay an initiation fee of $5.00. Non-resident members shall not be required to pay an initiation fee.

The annual dues of members and associates shall be $5.00.

The yearly payment of dues may be commuted by a single payment of $100.

Members and associates in arrears for dues for one year, may be dropped from the roll.

ARTICLE VII.

Special meetings may be called at any time by the Council, after five days' notice.

ARTICLE VIII.

The funds of the Society shall be deposited in the Chemical Bank of New York, and all checks and warrants must be countersigned by the president and treasurer jointly.

ARTICLE IX.

The duties of the officers and of the committees of the Society shall be similar to those generally devolving upon the officers and committees designated by their names and titles.

ARTICLE X.

No articles of these by-laws shall be altered or amended, except after two weeks' notice of the intended change. The assent of two-thirds of the members present is requisite to effect such an alteration.

RESIDENT MEMBERS.

M. Alsberg ..... New York.
B. G. Amend ..... New York.
J. P. Battershall ..... New York.
F. M. Baumgarten ..... New York.
A. Bourgougnon ..... New York.
Arno Behr ..... Jersey City, N. J.
F. A. Cairns ..... New York.
P. Casamajor ..... Brooklyn, E. D.
*Chas. F. Chandler ..... New York.
John W. Draper ..... New York.
Henry Draper ..... New York.
Chas. A. Doremus ..... New York.
F. A. C. Degenhardt ..... Brooklyn, E. D.
Hermann Endemann ..... New York.
*E. P. Eastwick ..... New York.
T. Egleston ..... New York.
Chas. Froebel ..... New York.

* The asterisks designate life members.

F. A. Grund.....New York.
G. W. Gesner.....New York.
Wm. E. Gifford.....Brooklyn, E. D.
H. v. Gehren.....Brooklyn.
J. Goldmark.....Brooklyn.
*W. M. Habirshaw.....New York.
H. H. Harnish.....Brooklyn.
J. B. F. Herreshoff.....Brooklyn.
Fred'k Hoffmann.....New York.
Chas. S. Homer.....New York.
St. Krackowitzer.....Hoboken, N. J.
O. H. Krause.....Jersey City, N. J.
Fred. Kammerer.....New York.
A. R. Ledoux.....New York.
L. H. Laudy.....New York.
John S. Lipps.....Brooklyn.
Henry Morton.....Hoboken, N. J.
Gideon E. Moore.....Jersey City, N. J.
H. E. Niese.....Jersey City, N. J.
W. H. Nichols.....New York.
C. C. Parsons.....New York.
Geo. N. Phelps.....Brooklyn.
Anthony Pirtz.....Dutch Kills, L. I.
P. de P. Ricketts.....New York.
Chas. Rice.....New York.
Samuel St. John.....New York.
E. Sherer.....Brooklyn.
Chas. S. Stone.....New York.
Chas. H. Schultz.....New York.
John C. Sticht.....Brooklyn.
Chas. M. Stillwell.....Brooklyn.
Waldron Shapleigh.....New York.
Elwyn Waller.....New York.
*Isidor Walz.....New York.
Charles J. Wendt.....Brooklyn.
H. N. Winans.....New York.

Number of resident members, 53.

NON-RESIDENT MEMBERS.

Isaac Adams, Jr.....Boston, Mass.
Wilbur O. Atwater.....Middletown, Conn.
Walter Balentine.....Middletown, Conn.
George F. Barker.....Univ. of Pa., Phil., Pa.
Thomas M. Blossom.....San Francisco, Cal.
Rachel L. Bodley.....Philadelphia, Pa.
Charles A. Brinley.....Germantown, Phil., Pa.

* The asterisks designate life members.

John J. Brown ..... Syracuse, N. Y.
William H. Chandler ..... Bethlehem, Pa.
Albert H. Chester ..... Clinton, N. Y.
S. Cabot, Jr ..... Boston, Mass.
Peter Collin ..... Burlington, Vt.
Chas. M. Cresson ..... Philadelphia, Pa.
Silas H. Douglas ..... Ann Arbor, Mich.
Thomas M. Drown ..... Easton, Pa.
Albert E. Ebert ..... Chicago, Ill.
Arthur H. Elliott, Highlands Chem. and
Mining Co. ..... Putnam Co., N. Y.
Frederick M. Endlich ..... Washington, D. C.
Francis E. Engelhardt ..... Syracuse, N. Y.
Adolphe A. Fesquet ..... Philadelphia, Pa.
Edward F. Fristoe ..... Washington, D. C.
Frederick A. Genth ..... Philadelphia, Pa.
Chas. A. Goessmann ..... Amherst, Mass.
Traill Green ..... Easton, Pa.
Roger B. Griffin ..... Middletown, Conn.
Hugh Hamilton ..... Harrisburg, Pa.
M. B. Hardin ..... Lexington, Va.
Edward Hart ..... Easton, Pa.
Maurice Hasenclever ..... Lawrence, Mass.
S. Dana Hayes ..... Boston, Mass.
Benjamin Hedrick ..... Washington, D. C.
Thomas Heys ..... Toronto, Canada.
Eugene W. Hilgard ..... Oakland, Cal.
Nathaniel P. Hill ..... Black Hawk, Col.
William B. Hills ..... Cambridge, Mass.
Gustavus Hinrichs ..... Iowa City, Iowa.
R. G. Hinsdale ..... Racine College, Wis.
Henry C. Humphrey ..... Philadelphia, Pa.
Thomas Sterry Hunt ..... Boston, Mass.
Henry Jameson ..... Indianapolis, Ind.
Chas. McIntire, Jr ..... Easton, Pa.
Robert C. Kedzie ..... Lansing, Mich.
Wm. K. Kedzie ..... Manhattan, Kas.
Hermann Kersting ..... Boston, Mass.
William J. Land ..... Atlanta, Ga.
S. A. Lattimore ..... Rochester, N. Y.
Gustave A. Liebig ..... Baltimore, Md.
John B. Lindsley ..... Nashville, Tenn.
J. Eneu Loughlin ..... Philadelphia, Pa.
Nathaniel T. Lupton ..... Nashville, Tenn.
John M. Maisch ..... Philadelphia, Pa.
J. W. Mallet ..... Univ. of Virginia, Va.
J. M. Mansfield ..... Mt. Pleasant, Iowa.
John P. Marshall, Somerville, P. O ..... College Hill, Mass.

J. Bellarvin	Louisville, Ky.
Wm. J. Martin	Davidson College, N. C.
John M. Merrick	Boston, Mass.
William M. Mew	Washington, D. C.
Thos. T. Morrell	Johnstown, Pa.
Chas. E. Munroe	Annapolis, Md.
Wm. McMurtrie	Washington, D. C.
Henry B. Nason	Troy, N. Y.
Arthur T. Neale	Middletown, Conn.
Maurice Perkins	Schenectady, N. Y.
N. A. Pratt	Lexington, Va.
Albert B. Prescott	Ann Arbor, Mich.
W. B. Rising	Alameda, Cal.
Robert E. Rogers	Philadelphia, Pa.
Benjamin Silliman	New Haven, Conn.
Paul Schweitzer	Columbia, Mo.
Stephen P. Sharples	Boston, Mass.
Wm. Simon	Baltimore, Md.
J. Lawrence Smith	St. Louis, Mo.
Wm. H. Taylor	Richmond, Va.
Wm. C. Tilden	Middletown, Conn.
Henry W. Vaughan	Providence, R. I.
Shippen Wallace	Philadelphia, Pa.
Chas. P. Williams	Rolla, Mo.
Henry A. Weber	Champaign, Ill.
Theodore G. Wormley	Columbus, O.

Resident members	53
Non-resident members	80
Total	133

The first regular meeting of the Society after organization was held May 4, 1876, Vice-President C. F. Chandler in the chair. Thirty members and fifteen visitors were present. Papers were presented, the names of eighteen persons were proposed for membership, and it was resolved to devote the funds derived from life membership exclusively to the formation of a library. The following standing rule was adopted: "Persons desiring to become members or associates must be proposed in writing by at least three members of the Society."

The Council reported that very favorable arrangements had been made with the editors of *The American Chemist* for publishing the proceedings of the Society. These proceedings were to be published in that journal and reprints of them issued for the use of the members under the title "Proceedings of the American Chemical Society."

During the remainder of the year 1876 regular meetings were held the first week of each month, except August, at which various papers were presented and discussed, and additional members elected.

Professor George F. Barker, chairman of the subsection of chemistry in the American Association for the Advancement of Science for the year 1876, at the beginning of his address before the section, alluded to the formation of the American Chemical Society, which he described as an event "which is of especial interest to the members of this section;" and in a spirit almost of prophecy he added: "The most agreeable relations exist between the Society and this subsection. To continue these relations it might be desirable to hold the August meeting of the Society jointly with that of this subsection of the American Association." After the lapse of many years, this result was virtually brought about, and during the past decade the summer meeting of the American Chemical Society has been held in connection with that of Section C of the American Association, the different sessions during the week being distributed between the two bodies.

At the meeting October 5, upon the recommendation of the Council, the following named persons were elected to honorary membership: M. P. E. Berthelot, Robert Bunsen, A. von Boutlerow, St. Cannizzaro, J. B. Dumas, E. Frankland, A. W. Williamson, Friedrich Woehler. A committee was appointed at this meeting to arrange for the inaugural address of President Draper. This address was delivered in Chickering Hall, November 16, 1876, the subject being "Science in America."

The membership roll as published in December, 1876, includes resident members 71, non-resident members 121, associate members 38; total, 230. Of this number three were enrolled as life members and four as life associates.

It is interesting to note that of the twenty distinguished chemists who have served the society as president during its history, sixteen—just four-fifths of the whole number—were upon its roll of membership during the first year of its existence, and the names of twelve of these—three-fifths of the entire number—appear in the first published list of members which was ordered to be printed at the meeting April 20, 1876, when the organization of the Society was completed. No comment is needed to prove the

ability and standing of those chemists to whom the Society is indebted for the record made in its earliest years, and we may be pardoned if we express the opinion that in spite of all the vicissitudes it has undergone, the breadth and solidity of the foundation upon which the American Chemical Society was built contained the "promise and potency," not only of permanence, but also of the representative character which it may now claim among American chemists and the prominent position which it now occupies among the national chemical societies of the world. If heredity counts for anything we may certainly boast of an ancestry of which any organization might be proud. We would not wish unduly to sound our own praises, but we believe that American chemists need not be ashamed of the estimate in which they are held by their scientific brethren in other nations, and we record with pride the fact that nearly all the chemists of our country who have enjoyed any considerable distinction during the past twenty-five years have, at some time, been active members of the American Chemical Society, and many of them have devoted much of their time, their talents, and their best energies to the administration of its affairs, to the shaping of its policy and to securing for it a permanent position of dignity and influence in the scientific world.

At the close of the year 1876 there was a balance of $1,363.04 in the treasury of the Society. At the meeting in March, 1877, the by-laws were so altered as to require all bills against the Society to be approved by the Council before payment. A by-law was also adopted which constituted a majority of the resident members of the Council a quorum for the transaction of business.

At the April meeting a resolution was adopted entrusting the custody, distribution and sale of the Society's publications to the Committee on Papers and Publications, and it was voted that copies of the Proceedings should be supplied at $5.00 per annum, and that no single numbers should be sold.

At the meeting in June it was decided:

(1) That the year of the Society shall date from January first.

(2) That the first volume of the Proceedings of the Society shall include the numbers for 1876 and 1877.

(3) That all members joining the Society before the end of 1877 shall be entitled to the first volume of the Proceedings.

Professor N. T. Lupton having extended to the Society an in-

vitation to attend the annual meeting of the American Association for the Advancement of Science at Nashville, Tenn., a vote was passed expressing the thanks of the Society for the invitation, and stating that it would not be convenient to accept as a body.

At the meeting November 1, 1877, the death of the recording secretary, Isidor Walz, was announced. It was also announced that letters of acceptance of honorary membership had been received from all those who had been elected except M. Dumas.

The Society was this year legally incorporated under the laws of the State of New York. The following is a copy of the certificate of incorporation :

CERTIFICATE FOR THE INCORPORATION

OF THE

AMERICAN CHEMICAL SOCIETY.

By these Presents, We, whose names are hereunto annexed, do associate ourselves together, and form a body politic and corporate, pursuant to, and in conformity with, the Act of the Legislature of the State of New York, passed on the twelfth day of April, in the year one thousand eight hundred and forty-eight, entitled, "An Act for the Incorporation of Benevolent, Charitable, Scientific and Missionary Societies," and the several acts amendatory thereof ; and do hereby certify :

That the name of the said Corporation is the "American Chemical Society."

That the object of this Society is the encouragement and advancement of chemistry in all its branches ; and by its meetings, reports, papers, discussions and publications, to promote scientific interests and inquiry.

That the office of the Society shall be in the City and County of New York.

That the number of Directors of the said Corporation shall be thirteen, of whom a majority shall be citizens of, and residents in, the State of New York.

That the names and residences of those who shall manage the

concerns of the Corporation for the first year are as follows, to wit:

C. F. CHANDLER, New York City.
HENRY MORTON, Hoboken, N. J.
M. ALSBERG, New York City.
W. M. HABIRSHAW, Astoria, N. Y.
P. CASAMAJOR, Brooklyn, N. Y.
E. SHERER, Brooklyn, N. Y.
W. H. NICHOLS, Brooklyn, N. Y.
H. ENDEMANN, New York City.
W. SHAPLEIGH, New York City.
E. P. EASTWICK, Elizabeth, N. J.
H. C. HAVEMEYER, New York City.
J. GOLDMARK, Brooklyn, N. Y.
HENRY DRAPER, New York City.

In witness whereof, we have hereunto set our hands and seals this day of October, 1877.

In presence of

HENRY DRAPER, New York. [L. S.]
GEORGE F. BARKER, Philadelphia. [L. S.]
CHARLES F. CHANDLER, New York. [L. S.]
J. LAWRENCE SMITH, Louisville, Ky. [L. S.]
W. H. NICHOLS, 192 State St., Brooklyn. [L. S.]
H. ENDEMANN, 458 West 35th St., N. Y. [L. S.]
P. CASAMAJOR, 471 Lafayette Ave., Brooklyn. [L. S.]
EDW. P. EASTWICK, 138 Chilton St., Elizabeth, N. J. [L. S.]

STATE, CITY AND COUNTY OF NEW YORK, } *ss.*

On this thirtieth day of October, A. D. 1877, before me came W. H. Nichols, H. Endemann, P. Casamajor and Edw. P. Eastwick, all to me known to be the same persons described in, and who executed the foregoing instrument, and they severally acknowledged to me, that they executed the said instrument for the uses and purposes therein mentioned.

[L. S.] WILLIAM F. T. CHAPMAN,
Notary Public, N. Y.

STATE, CITY AND COUNTY OF NEW YORK, } *ss.*

On this twenty-fifth day of October, 1877, before me came Henry Draper, George F. Barker and Charles F. Chandler, all to me known to be the same persons described in, and who executed the foregoing instrument, and who

severally acknowledged to me, that they executed the same instrument for the uses and purposes therein mentioned.

[L. S.] JOHN FRANCIS MEYER,
Notary Public, N. Y. Co., N. Y.

STATE, CITY AND COUNTY OF NEW YORK, } ss.

On this twenty-ninth day of October, 1877, before me came J. Lawrence Smith, to me known to be one of the persons described in, and who executed the foregoing instrument, and who acknowledged to me, that he executed the said instrument for the uses and purposes therein mentioned.

[L. S.] JOHN FRANCIS MEYER,
Notary Public, N. Y. Co., N. Y.

(ENDORSED.)

NEW YORK, Nov. 8, 1877.

I, one of the Justices of the Supreme Court of the First District, hereby approve of the within certificate for the incorporation of the American Chemical Society, and consent, that it be filed.

ABM. R. LAWRENCE,
J. S. C.

STATE OF NEW YORK, OFFICE OF THE SECRETARY OF STATE, } ss.

I have compared the preceding with the original Certificate of Incorporation of American Chemical Society with acknowledgment thereto annexed, filed in this office on the ninth day of November, 1877, and do hereby certify the same to be a correct transcript therefrom and of the whole of the said original.

Witness my hand and the seal of office of the Secretary of State, at the city of Albany, this tenth day of November, one thousand eight hundred and seventy-seven.

EDGAR K. APGAR,
Dp. Secretary of State.

The incorporation of the Society, together with the necessary changes of the by-laws, was adopted at the meeting December 6, 1877, and a Board of Trustees for 1878 was elected, in accordance therewith.

A list of members published in December, 1877, includes honorary members, 7; members (active), 221; associates, 61; total, 289. The following is a list of the officers of the Society for the year 1877.

President—J. Lawrence Smith.

Vice-Presidents—C. F. Chandler, Henry Morton, Silas H. Douglass, Chas. A. Goessmann, T. Sterry Hunt, S. W. Johnson.

Corresponding Secretary—George F. Barker.
Recording Secretary—I. Walz.
Treasurer—W. M. Habirshaw.
Librarian—P. Casamajor.
Curators—E. Sherer, W. H. Nichols, F. Hoffmann.
Committee on Papers and Publications—H. Endemann, E. Waller, W. Shapleigh.
Committee on Nominations—E. P. Eastwick, H. C. Havemeyer, Chas. Froebel, D. Goldmark, Henry Draper.

At the meeting January 3, 1878, the Committee on Papers and Publications announced that they had made arrangements with Messrs. Baker and Godwin for the publication of the Proceedings, which had previously been published by the editors of *The American Chemist.*

The treasurer of the Society reported at the meeting December 5, 1878, that there was a balance of $1208.44 in the bank to the credit of the Society; also that there were amounts due the Society aggregating about $2300, with the probability that only about $1500 could be collected. He added, "many members upon the books have never paid anything, and many more have never paid after their first remittance," and advised "the appointment of a committee to revise the list of members, and report such names as they deem advisable to have dropped from the roll." The librarian in his report "congratulates the Society upon the present state of the library, as affording promise of collecting in time a large and valuable library. The library, it is true, is small but contains already many standard works, as well as some valuable on account of their distinguished authors or the time at which they were published." A total of 65 works, in 344 volumes, was reported as belonging to the library. The idea of gathering a loan collection for the library, which originated with Mr. Casamajor, was recommended by the librarian, who hoped that the members would be ready not only to contribute to this, but also to donate to the library such books and pamphlets of interest to chemists as they might be able to spare.

The membership roll for 1878 showed 7 honorary members, 59 associates, and 249 active members; total, 315. The following is a list of officers for the year 1878:

President—S. W. Johnson.

Vice-Presidents—B. Silliman, J. C. Booth, H. Draper, G. F. Barker, P. Casamajor, C. F. Chandler.

Corresponding Secretary—H. Morton.

Recording Secretary—M. Alsberg.

Treasurer—W. M. Habirshaw.

Librarian—E. Waller.

Curators—J. Goldmark, O. H. Krause, C. Pickhardt.

Committee on Papers and Publications—H. Endemann, W. Shapleigh, A. Behr.

Committee on Nominations—E. P. Eastwick, E. L. Youmans, E. R. Squibb, H. C. Havemeyer, C. H. Schultz.

At the February meeting in 1879, upon the recommendation of the treasurer, a committee was appointed "to mature a plan of action for the collection of the amount due the Society for arrears of dues, and to report the names of members to be dropped from the rolls of the Society for such non-payment." It was also resolved in accordance with the action of the Board of Directors, "that no one should be considered a member of the Society, or receive the proceedings or their publications, until he shall have paid his initiation fee and dues for the current year." After investigation, this committee reported 104 members in arrears, of whom 42 had never paid one cent.

On March 6, 1879, it was decided "that the publication of the Society should, in the future, be known as the 'Journal of the American Chemical Society,' which shall be published monthly, and contain the proceedings, original papers, reprints, résumés of special subjects, and abstracts of important papers published in other journals."

The question of admitting advertisements to the covers of the Journal was referred to the Committee on Publications to report at the next meeting of the Board of Directors. It was voted "that this committee report a list of abstractors and reviewers of current chemical literature, and that the names of the Committee on Publications, the abstractors and reviewers, appear on the title-page of the Journal."

A motion to pay the sum of $100 annually to the member of the Committee on Publications whom that committee should appoint "working editor," was laid on the table.

Dr. Ira Remsen gave a description of a new Journal devoted to chemistry which he was about to publish.

The question of advertising having been favorably acted upon subsequently, advertisements were received and inserted on the inside pages of the cover, beginning with Volume I of the Journal.

On May 1, 1879, upon recommendation of the Committee on Delinquents, the names of 49 members were dropped from the roll of the Society for non-payment of dues and initiation fee, and 23 members in arrears for the year 1878 were suspended from membership until they should pay their arrears.

It was voted that all moneys received for advertisements in the Journal be used solely as a publication fund; also that the price-list of advertisements be left to the Publication Committee.

At the meeting June 5, it was resolved that "names of the proposers and seconders of all candidates for membership be published in the minutes."

In October, a committee previously appointed for that purpose, reported a plan for conducting the annual election of the Society whereby members living at a distance from New York might have better opportunities for being represented, and upon motion of Dr. Alsberg, chairman of the committee, the report was adopted.

At the November meeting the annual dues of members residing in New York City, or within a radius of thirty miles about New York, were made $10.00, and they were required to pay, in addition, an initiation fee of $5.00. It was also decided that other members and associates should be required to pay only $5.00 annual dues, and no initiation fee. This regulation remained in force till January, 1881, when the annual dues of resident members were reduced to $5.00.

The directory for the year 1879, published in November, contains a list of 7 honorary members, 57 associates, and 225 active members, making a total of 289. The following is a list of officers for the year 1879:

President—T. Sterry Hunt.

Vice-Presidents—F. A. Genth, A. B. Prescott, Ira Remsen, A. R. Leeds, E. R. Squibb, W. M. Habirshaw.

Corresponding Secretary—P. Casamajor.

Recording Secretary—S. A. Goldschmidt.

Treasurer—W. H. Nichols.

Librarian—Elwyn Waller.

Curators—P. de P. Ricketts, J. B. F. Herreshoff, C. M. Stillwell.

Committee on Papers and Publications—H. Endemann, A. Behr, G. E. Moore.

Committee on Nominations—R. A. Fisher, G. M. Miller, Hanbury Smith, A. Bourgougnon, G. A. Prochazka.

Board of Directors—A. R. Leeds, E. R. Squibb, W. M. Habirshaw, P. Casamajor, S. A. Goldschmidt, W. H. Nichols, E. Waller, C. F. Chandler, H. Endemann, J. Goldmark, C. H. Schultz, G. M. Miller, E. P. Eastwick.

At the meeting March 4, 1880, a committee was appointed to raise a permanent fund to defray the working expenses of the Society and the cost of publication of the Journal, subscriptions being conditional upon the raising of the entire fund proposed, $15,000.

In response to an invitation from the Boston Academy of Arts and Sciences, Messrs. Sharples, C. A. Goessmann, and W. B. Hills were appointed to represent the American Chemical Society at the celebration of the 100th anniversary of the Academy.

In connection with the meeting of the American Association for the Advancement of Science held in Boston, in August, 1880, a subscription dinner was held under the auspices of the American Chemical Society, which formed one of the most interesting features of the meeting of the association that year.

There are no membership statistics available for the year 1880. The following is a list of officers for that year:

President—F. A. Genth.

Vice-Presidents—C. F. Chandler, J. W. Mallet, T. G. Wormley, Ira Remsen, A. R. Leeds, E. R. Squibb.

Corresponding Secretary—P. Casamajor.

Recording Secretary—Arthur H. Elliott.

Treasurer—W. H. Nichols.

Librarian—E. Waller.

Curators—S. A. Goldschmidt, S. P. Sharples, A. A. Fesquet.

Committee on Papers and Publications—H. Endemann, Arno Behr, Gideon E. Moore.

Committee on Nominations—Hanbury Smith, George M. Miller, J. Goldmark, A. Bourgougnon, J. C. Battershall.

Directors—C. F. Chandler, A. R. Leeds, E. R. Squibb, P.

Casamajor, A. H. Elliott, W. H. Nichols, E. Waller, H. Endemann, H. Morton, W. M. Habirshaw, J. Goldmark, C. Tessié du Motay, and E. P. Eastwick.

During the latter part of the year 1880, the Society was without funds, and had incurred an indebtedness of $900, while its assets were only nominal, amounting to about $1000 in the form of membership dues unpaid. In this crisis the publication of the *Journal* was temporarily suspended, and funds sufficient to liquidate the indebtedness were obtained from personal contributions by the Directors in sums ranging from $25 to $75 each. At the meeting of the Directors, November 15, 1880, it was voted that no expenditure should be incurred hereafter until the necessary funds to meet such expenditure were in the hands of the treasurer.

Meanwhile the committee appointed to raise an endowment fund was actively at work, and continued its efforts with unabated zeal during the following year, so that at the meeting December 2, 1881, Dr. Leeds, on behalf of the committee, reported that the amount subscribed was approaching $10,000.

The list of members published October, 1881, includes the names of 7 honorary members, 61 associates, and 246 active members; total, 314. The following is a list of officers for the year 1881:

President—Charles F. Chandler.

Vice-Presidents—A. R. Leeds, E. R. Squibb, Henry Morton, G. A. Koenig, C. A. Goessmann, Ira Remsen.

Corresponding Secretary—P. Casamajor.

Recording Secretary—James H. Stebbins, Jr.

Treasurer—W. H. Nichols.

Librarian—E. Waller.

Curators—Wm. Rupp, A. A. Fesquet, A. J. Rossi.

Committee on Papers and Publications—Arno Behr, A. R. Ledoux, H. Endemann.

Committee on Nominations—William Geyer, Jas. H. Stebbins, O. H. Krause, Arthur H. Elliott, J. C. Battershall.

Directors—A. R. Leeds, E. R. Squibb, H. Morton, P. Casamajor, Albert H. Gallatin, W. H. Nichols, E. Waller, A. R. Ledoux, C. F. Chandler, H. Endemann, W. M. Habirshaw, M. Alsberg, J. Goldmark.

At the meeting January 6, 1882, the death of the first president of the Society, Professor John W. Draper, was announced, and a committee was appointed to wait on Professor C. F. Chandler and request him to write an obituary notice of Dr. Draper.

At this meeting it was voted that all members in arrears of dues up to December 31, 1880, be dropped from the roll of the Society. At the February meeting the question was reconsidered, and it was voted that all in arrears of dues to December 31, 1879, be dropped, and that a committee be appointed to prepare a list of members whose dues have been properly paid.

At the meeting May 5, 1882, it was voted that all papers read before the Society should become the lawful property of the Society till thirty days from the time when they were read. At the meeting in December of the same year, this action was rescinded.

Ex-President J. Lawrence Smith died October 12, 1883, and a brief account of the life and labors of that eminent scientist, written by Professor Silliman, was printed in the last number of the Journal for that year.

At the meeting May 7, 1884, it was voted that ten members of the Society should constitute a quorum for the transaction of business.

At the June meeting of the same year, Professor A. W. Hofmann, of Berlin, and Professor Chevreul, of Paris, were elected honorary members of the Society.

A gold medal was presented to Professor Hofmann during this year by his American admirers in appreciation of his contributions to chemical science, and in commemoration of his visit to America in 1883. The majority of the subscribers to the medal were members of the American Chemical Society, and more than three-fourths of the cost was borne by them. The president of the Society, Dr. James C. Booth, of the United States Mint in Philadelphia, supervised the execution of the medal. A very cordial letter was received from Professor Hofmann, returning his thanks for the compliment, and expressing his high appreciation of the assurances of personal friendship which accompanied its bestowal.

At the meeting in February, 1885, the death of Professor Benjamin Silliman was announced, and at the meeting December 4, 1887, the death of Mr. P. Casamajor, for years corresponding secretary of the Society.

In 1889, Professor A. Kekulé, of Bonn, Germany, was elected an honorary member of the Society, and his acknowledgment of the compliment was reported at the meeting in June of that year. Professor D. Mendeléeff, of St. Petersburg, was also elected an honorary member in 1889.

The large number of chemists in and around New York City who were connected with the American Chemical Society, and the active interest which they had always manifested in its welfare in time produced the impression upon many members in other parts of the country that the Society was local rather than national in its character and aims. This impression was deepened by the fact that all the meetings of the Society were held in New York City, and many of the executive officers and active members of standing committees resided there, although the president was nearly always chosen from some other section of the country, as were also a number of the vice-presidents and other prominent officers. While the main features of this general plan were like those which had been successful in the national chemical societies of the Old World, and the American Chemical Society was following the precedent established in England, France, Germany, etc., yet it did not prove acceptable to the members residing at a distance from New York. These members did not come into so active relations with the Society and its work as was desirable, and they could not be prevailed upon to take sufficient interest in its welfare, nor to assume their share of responsibility in its management.

This state of affairs was unsatisfactory to every one, and it devolved heavy burdens upon the members residing in New York City and vicinity. There was no alternative, however; those members were obliged to carry the burdens until some plan could be devised by which the interest and active cooperation of a larger body of chemists throughout the country could be permanently enlisted. The task was an arduous one, but they undertook it with stout hearts; and with heroic self-sacrifice, unflinching purpose, and unshaken faith in the ultimate result, they persevered in their work.

Meanwhile, persons prominently connected with the Chemical Section of the American Association for the Advancement of Science, together with some others, believing that the chemists of the country could be best united in a successful national organi-

zation by establishing another society, founded upon an entirely new basis, had already put forth considerable effort in that direction. Those who had been entrusted with the management of the American Chemical Society met this movement with the claims that the Society they represented had been recognized abroad for years as the organized body of the chemists of America; that it had already acquired something of prestige and established rights; that it had been built upon a solid foundation which admitted of broadening and strengthening to any desired extent; and that it was only by utilizing what the American Chemical Society had already gained that the best results could be expected. Those who were controlling its affairs had already begun to effect radical changes in the management and operations of the Society, changes which, when well inaugurated, would enable them to make much progress in realizing the ideals of those who were urging a new national organization of chemists; and if the chemists who had hitherto held aloof would become members of the Society and add their influence, their counsel and their energies to the forces already in operation, a complete and satisfactory plan could be devised which would command the active support of the great body of American chemists, and secure adequate recognition for them and their work among the chemists of the world.

The importance of the points thus urged gained for them due consideration, and a satisfactory plan was finally agreed upon at a general conference of delegates representing chemical societies from various sections of the country, held in Washington, D. C., August, 1891, upon the occasion of the third general meeting of the American Chemical Society and the meeting of the American Association for the Advancement of Science in that city. The essential features of this plan were as follows:

1. The American Chemical Society under its own name and charter, with all its vested rights and privileges and the prestige it had acquired at home and abroad, was to form the nucleus around which should be gathered the body of chemists in the New World, and in which should center their united interests, their efforts, their hopes and aspirations.

2. All chemists in America were invited to join this Society, to utilize to the best advantage what it had already gained, to broaden and strengthen its foundations, and by their active per-

sonal interest and hearty co-operation to insure its permanent efficiency and success as the representative body of American chemists.

3. The new departure which the Society had made under its revised constitution and by-laws was recognized to be in the right direction, but it was found that other important changes were also desirable. Provision had already been made for holding general meetings outside of New York City and for establishing local sections of the Society in different parts of the country after the plan of the Society of Chemical Industry. These were to be continued as permanent features, and the meetings in New York City were to be held under the auspices of the local New York Section. The Society itself was to hold only two regular meetings each year, the time and place for which should be determined beforehand in each instance by the Council, which was henceforth to have the management of all the important affairs of the Society. This Council was at first composed of fifteen members, the president, the general secretary, and the editor, *ex-officiis*, and twelve others chosen by ballot at the annual election of the Society, four being elected each year to serve for a period of three years.

The revised constitution of the Society was adopted June 6, 1890, and the new by-laws followed soon after. The first general meeting was held under the provisions of this constitution August 6th and 7th, of the same year, in Newport, R. I. At this meeting the question of adapting the Society to the requirements for a broadly representative national organization was fully discussed and Professor F. W. Clarke, of Washington, presented the views of the chemists of Section C of the American Association for the Advancement of Science, and others who had been considering the proposition to form a new chemical society. This discussion did much to pave the way for the conferences which followed, and which culminated in the general conference held in Washington, August, 1891, at which the plan above outlined was adopted.

The second general meeting of the Society was held in Philadelphia, December 30 and 31, 1890.

The first local section of the Society was authorized January 21, 1891, to be established in Rhode Island, with headquarters in Providence.

A committee was appointed by the Board of Directors December 9, 1891, to revise the constitution and by-laws again so as to adapt the methods and plan of organization of the Society to the views that prevailed at the Washington conference. The representative character of this committee will be readily seen by inspecting the list of names and addresses of its members as here given: George C. Caldwell, Ithaca, N. Y., chairman; Albert C. Hale, Brooklyn, N. Y., secretary; F. W. Clarke, Washington, D. C; H. W. Wiley, Washington, D. C.; L. M. Norton, Boston, Mass.; H. H. Nicholson, Lincoln, Nebr.; A. A. Breneman, N. Y. City; George F. Barker, Philadelphia, Pa.; P. T. Austen, N. Y. City; A. H. Sabin, Long Island City, N. Y.; A. B. Prescott, Ann Arbor, Mich.; William McMurtrie, N. Y. City; Alfred Springer, Cincinnati, O.; C. E. Munroe, Newport, R. I.; Durand Woodman, N. Y. City.

This committee undertook the work of a complete re-organization of the Society. After various meetings and a thorough consideration of the whole situation, a final report was made and the new constitution, as thus prepared, was adopted November 4, 1892. Suitable by-laws were afterward presented, and adopted October 27, 1893.

This constitution was considered a great advance beyond any under which the Society had thus far operated, but it was still unsatisfactory, and another was adopted December 2, 1897. The corresponding by-laws went into effect April 12, 1898. With the exception of certain amendments which were passed in July, 1899, this last-named constitution and by-laws are those by which the Society is now governed (April, 1901).

The successive revisions of constitution and by-laws might be supposed to indicate an unsettled state of affairs in the Society and an uncertainty of plan and purpose that promised poorly for the future. But every step taken was one of progress in the right direction: there was no retrograde movement. As the Society grew in numbers and influence, it cast aside its former limitations, and adopted measures better suited to its needs and environment. Its growth was continuous, rapid, healthy, and practically uniform, as is shown by the curve representing its steady gain in membership since its reorganization.

At the meeting May 6, 1892, the death of Professor A. W. Hofmann, one of the honorary members of the Society, was announced.

The death of Professor F. A. Genth, former president of the Society, was announced March 4, 1893.

The Board of Directors, January 8, 1893, accepted the proposition of Edward Hart to suspend the publication of his *Journal of Analytical and Applied Chemistry*, and to publish and edit the *Journal of the American Chemical Society*, upon terms mutually agreed upon. Professor Hart has continued as editor of the Journal up to the present time, and it is still published by The Chemical Publishing Company, Easton, Pa., Edward Hart, proprietor, the latest contract for its publication having been signed but a few months ago.

The seventh general meeting of the Society was held in Chicago, August 21 and 22, 1893, in connection with the World's Congress of Chemists, at the Columbian Exposition.

At the ninth general meeting held in Brooklyn, N. Y., August, 1894, Professor Wolcott Gibbs, of Newport, R. I., emeritus professor at Harvard, was elected honorary member of the Society. This was the first instance of an American being thus honored.

At the summer meeting in 1895, the secretary reported that in accordance with instructions given him by the Council, he had secured the enactment of a law by the legislature of the State of New York removing all restrictions as to the residence and place of meeting of the directors of the Society.

At the meeting held in Buffalo, August 21 and 22, 1896, a Joint Committee, composed of a special committee from the American Chemical Society, and one from Section C of the American Association for the Advancement of Science, adopted a plan which has since been followed and has resulted in bringing the summer meetings of the two bodies of chemists into such harmonious adjustment that the interest and attendance upon both have been materially increased. The two meetings are held in the same week, the American Chemical Society having charge on Monday and Tuesday, with the exception that time is allowed for Section C to organize in the morning, and in the afternoon of Monday to listen to the address of its vice-president. The remainder of the week is devoted entirely to the sessions of Section C.

An agreement was made December 29, 1896, with Arthur A. Noyes, of Boston, editor of the Review of American Chemical Research, for the publication of said Review in the *Journal of the*

American Chemical Society. This publication has been continued up to the present time.

At the meeting in Boston, August, 1898, Henri Moissan, Sir William Crookes, and J. H. van't Hoff were elected honorary members of the Society.

In December, 1898, the Council directed the establishment of a life membership fund by the investment of twelve hundred dollars ($1200) to guarantee in perpetuity the interests of the following named persons who at different times had paid each $100 for a life membership in the Society: Charles F. Chandler, W. M. Habirshaw, T. Sterry Hunt, W. P. Mason, Elwyn Waller, J. O. Donner, H. C. Havemeyer, T. A. Havemeyer, Adolph Kuttroff, Wm. Pickhardt, W. P. Prentice, and Charles H. Senff.

The investment was accordingly made by the treasurer under the authority of the directors, and additions have been made to the fund at different times as dues have been received from others who have qualified as life members, five hundred dollars ($500) having been thus paid by the following persons: Charles E. Munroe, Charles B. Dudley, Morris Loeb, Elihu Thomson and Harwood Huntington.

The present constitution provides that the interest of such life membership fund which is not required to guarantee the future interests of the life members shall be set aside as a "Research Fund," from which appropriations may be made annually by the Council but only for the purposes of chemical research.

At the meeting in New York, June 25 and 26, 1900, Professor Wilhelm Ostwald and Professor Edward W. Morley were elected honorary members of the Society. Professor Morley is the second American honorary member.

At the meeting of the Council in Columbus, O., August 21, 1899, upon motion of Dr. Hart, the following suggestions made by Dr. Baskerville, were referred to a committee of three for consideration and recommendation, the committee to be appointed by the president:

"I would suggest that on account of the twenty-fifth anniversary of the establishment of the Society, a medal be given to that chemist who, in the opinion of the Council, has made the most valuable contribution to chemical knowledge during the current year, and further that the medal be called the Priestley medal."

Charles E. Munroe, Albert B. Prescott, and J. W. Mallet were appointed as the committee to consider and report upon Dr. Baskerville's motion.

At the New Haven meeting, December 28, 1899, this committee reported adversely upon the question of the medal but recommended a plan for celebrating the twenty-fifth anniversary of the Society. The report of the committee was accepted and its recommendations adopted.

At the New York meeting in June, 1900, the president of the Society was authorized and directed to appoint a committee, of which he himself should be chairman, with power to arrange for the celebration. The committee arranged a plan for the celebration which is outlined in a general circular sent to the members of the Society of which the following is a copy:

TWENTY-FIFTH ANNIVERSARY
OF THE
AMERICAN CHEMICAL SOCIETY.

The twenty-fifth anniversary of the organization of the American Chemical Society will be celebrated by a general meeting of the Society, to be held in New York City, Friday and Saturday, April 12 and 13, 1901. Suitable addresses will be delivered, and a history of the Society from its inception will be presented. A committee has been appointed to prepare a general review of what has been accomplished in this country in chemistry during the past twenty-five years, together with the present outlook of the science, both pure and applied, in America. A number of guests are expected representing officially other national scientific bodies, and invitations are to be extended to prominent foreign chemists to be present and take part in the festivities. The election of some additional honorary members will also commemorate the occasion.

The details of arrangements are not yet complete, but the following statements will give an idea of the general plan for the meeting:

Friday, April 12th, at 10 A.M., books for registration will be opened at the Chemists' Club, 108 West 55th Street, New York,

where general information may be obtained regarding the meeting. Program, list of hotels, tickets for subscription dinner, etc., will be there for distribution.

At 1 P.M. luncheon will be served at the Chemists' Club, through the courtesy of the New York Section of the Society.

The first session of the meeting will be held at the same place at 2.30 P.M., and an evening session for more formal addresses at 8.30.

Saturday will be devoted to visits and excursions. In the evening it is expected that a subscription dinner will be given.

Members and guests desirous of visiting any special chemical works or educational institutions, or other points of interest, are requested to leave their names, together with a statement of the places which they may wish to visit at the time of registration on Friday morning, or they may send such statement by mail at any time to the Chairman of the Committee on Meetings and Entertainment, care of Chemists' Club, 108 West 55th Street, New York City.

Some time ago the members of the Society were requested to make a special effort to raise the total membership of the Society to 2,000 by the time of the celebration of the twenty-fifth anniversary. The response to this request from some of the members has been highly satisfactory, but a more general and immediate effort will be necessary in order to secure the desired result. You will find enclosed herewith a membership blank, which you are earnestly requested to use in nominating to membership in the Society some suitable person of your acquaintance. If any more of these nomination blanks are desired, kindly apply to the secretary at once, and they will be forwarded.

You will find enclosed also a slip which you are requested to fill out and return to the secretary without delay, in order that the local committee may know whether you expect to attend the meeting. Kindly give your address as you wish it entered on the roll of the Society.

ALBERT C. HALE,
Secretary of the American Chemical Society.

551 Putnam Ave., Brooklyn, N. Y.,
March, 1901.

The following is a copy of the program issued for the meeting.

TWENTY-FIFTH ANNIVERSARY

OF THE

AMERICAN CHEMICAL SOCIETY.

TWENTY-THIRD GENERAL MEETING.

The sessions for the celebration of the twenty-fifth anniversary of the Society will be held in the Assembly Hall of the Chemists' Club, 108 West 55th Street, New York City, by special invitation of the trustees of the club. The Registration Committee will be in attendance at the Chemists' Club, Friday, April 12th, at 10 A.M., where general information may be obtained regarding the meeting.

Programs, lists of hotels, tickets for subscription dinner, etc., will be distributed by the committee, and a list of visits and excursions will be open for inspection. Members and guests are requested to register early, *and at time of registration to indicate their wishes regarding visits and excursions, and to obtain their dinner tickets;* price per plate, $3.00.

The rooms of the club will be the headquarters for the Anniversary celebration, and all are invited to avail themselves of the opportunity to meet their friends there.

At 1 P.M. on Friday, luncheon will be served at the Chemists' Club, through the courtesy of the New York Section of the Society.

PROGRAM.

FRIDAY, APRIL 12TH, 2.30 P.M.

1. Welcome by Chairman of New York Local Section ..... C. A. DOREMUS.
2. Welcome by President of Chemists' Club ..... T. J. PARKER.
3. Response by President ..... F. W. CLARKE.

Reports from the History Committee.

4. "Chemical Societies of the XIX Century" ... H. CARRINGTON BOLTON.
5. "Historical Sketch of the American Chemical Society" ALBERT C. HALE.
6. "Organization and Development of the Chemical Section of the American Association for the Advancement of Science" ..... MARCUS BENJAMIN.

Reports from the Census Committee.

7. "Progress in Organic Chemistry during the Past Twenty-five Years" ..... W. A. NOYES.
8. "Progress in Opportunities for Advanced Inorganic Work" L. M. DENNIS.
9. "Aims and Opportunities Offered in Physical Chemistry in America" ..... LOUIS KAHLENBERG.

10. "Improved Teaching in Technical Chemistry, and Results Accomplished by the Application of Chemistry to the Arts, in America, since the Founding of the American Chemical Society" ..... CHAS. E. MUNROE.
11. "Progress of Teaching Chemistry in the Schools since the Founding of the American Chemical Society" ..... RUFUS P. WILLIAMS.
12. Report of the Work of the Census Committee" ..... CHARLES BASKERVILLE, *Chairman.*
13. General business.
14. Announcements.
15. Adjournment.

FRIDAY, 8.30 P.M.

ADDRESSES.

"The Dignity of Chemistry" ..... H. W. WILEY.
"Formation of the American Chemical Society" ..... C. F. CHANDLER.

SATURDAY, APRIL 13TH.

The Council and the Board of Directors will meet in the library of the Chemists' Club at 9 A.M.

Visits and excursions are arranged as follows:

Route 1.—Guggenheim Smelting Works, Perth Amboy, N.J.; Pacific Coast Borax Co.; Tide Water Oil Co., Bayonne, N. J.

Route 2.—Drive by stage from Chemists' Club through Central Park to New York University. Return *via* Columbia University, Grant's Tomb and the Museum of Natural History, stopping at the points mentioned.

Route 3.—Mine, Reduction Works and Electrolytic Plant of Arlington Copper Co., Arlington, N. J.

Route 4. -Carl H. Schultz Mineral Water Factory; National Lead Co., Jewett White Lead Works, Staten Island. Special boat will be provided by courtesy of the company.

Subscription dinner for gentlemen and ladies at Hotel Savoy, Fifth Avenue and 59th Street, New York, at 7.30 P.M.

Ladies are invited also to all other exercises and privileges of the anniversary celebration.

LIST OF HOTELS AND RATES.

Park Avenue, 33d St. and Park Ave., American Plan, $3.50 up; European plan, $1.00 up. *Plaza*, 5th Ave. and 59th St., European plan, $2.00 up. *Savoy*, 5th Ave. and 59th Street, European plan, $2.00 up. *Waldorf-Astoria*, 34th Street and 5th Ave., European plan, $3.00 up. *Majestic*, 72d Street and 8th Ave., European plan, $2.50 up. *Ashland House*, 4th Ave. and 24th

Street, American plan, $2.00 to $3.00 a day; European plan, $1.00 up. *Bartholdi*, 23d Street and Broadway, European plan, $1.00 up. *Grenoble*, 56th Street and 7th Ave., European plan, $1.50 up. *Hoffman House*, 25th Street and Broadway, European plan, $2.00 up. *Holland House*, 5th Ave. and 30th Street, European plan, $2.50 up. *Fifth Avenue*, 23d Street and 5th Ave., American plan, $5.00 up; European plan, $2.00 up. *Manhattan*, 42d Street and Madison Ave., European plan, $2.00 up. *Murray Hill*, 40th Street and Park Ave., European plan, $2.00 up; American plan, $4.00 up. *Netherland*, 59th Street and 5th Avenue, European plan, $2.00 up. *New York*, 42d Street, opposite Grand Central Depot, European plan, $1.00 up.

COMMITTEES OF TWENTY-FIFTH ANNIVERSARY CELEBRATION.

General Committees.

Wm. McMurtrie, *Chairman.* Albert C. Hale, *Secretary.*

Finance—John H. Long, C. B. Dudley, John Alden, F. E. Dodge, Alfred Springer.

Invitations—Edward W. Morley, George F. Barker, W. B. Rising, Ira Remsen, C. L. Jackson, S. W. Johnson, H. W. Wiley.

History—H. C. Bolton, A. B. Prescott, Albert C. Hale, Henry Morton, C. A. Goessmann, Marcus Benjamin.

Program and Papers—C. A. Doremus, W. P. Mason, H. H. Nicholson, Jas. Lewis Howe, L. M. Dennis.

Reception—J. W. Mallet, J. H. Appleton, C. F. Chandler, F. W. Clarke, George C. Caldwell.

Census—Charles Baskerville, C. E. Munroe, Edgar F. Smith, W. A. Noyes, Louis Kahlenberg.

Local Committees.

C. A. Doremus, *Chairman.* Durand Woodman, *Secretary.*

Finance—M. E. Waldstein, M. Toch, George C. Stone, Hugo Schweitzer, C. F. Chandler, W. H. Nichols, J. B. F. Herreshoff.

Meetings and Entertainments—E. E. Smith, W. J. Schieffelin, Morris Loeb, J. F. Geisler, J. H. Wainwright.

Press and Printing—Charles F. McKenna, C. L. Reese, Durand Woodman.

Membership—T. J. Parker, M. T. Bogert, Ludwig Saarbach, Waldemar Lee, Clifford Richardson.

Hotels and Transportation—A. P. Hallock, J. H. Wainwright, Clifford Richardson, E. F. Hicks.

Registration—J. F. Geisler, C. A. Doremus, Clifford Richardson, T. J. Parker.

At a joint meeting of the general and local committees, held at the Chemists' Club, N. Y., March 15, 1901, M. E. Waldstein was chosen treasurer of the joint committees.

Present Organization and Statistics.

The objects of the American Chemical Society are "the advancement of chemistry and the promotion of chemical research." The large majority of its members are resident chemists of the United States of America, but there are no geographical or national restrictions, and representatives from nearly every civilized nation in the world are included in its membership. Its work and aims are limited only to the objects for which the Society was established, and its field of influence is as broad as the science which it undertakes to represent and promote.

Any person who has had adequate training in chemistry may be elected a member, and any other person interested in the promotion of chemistry may be elected an associate. Associates have all the privileges of members except the rights of voting, holding office, and serving on committees. The constitution provides that any member or associate, not in arrears, paying at any one time the sum of $100 into the treasury of the Society as commutation for dues, shall become a life member or life associate, being exempt from the further payment of annual dues, and receiving all the regular publications of the Society. Any person whose achievements in chemistry may be considered as entitling him to special recognition as an authority in theoretical or applied chemistry may be elected as an honorary member, but only in a general meeting of the Society, after his name has been presented in writing by ten members of the Society, and he has, in addition, received the written endorsement of a majority of the Council. Any person who has rendered eminent service to the Society may be made an honorary associate by a two-thirds vote of the Council. The Society has upon its roll all these classes of members except the last-named,—honorary associates. The following is a list of those who have been honorary members of the Society: M. Berthelot, Paris, France; A. Boutlerow, St. Petersburg, Russia; R. W. Bunsen, Heidelberg, Germany; Stanislao Cannizzaro, Rome, Italy; E. Chevreul, Paris, France; William Crookes, London, England; E. Frankland, Reigate, England; Wolcott Gibbs, Newport, Rhode Island; A. W. von Hofmann, Berlin, Germany; A. Kekulé, Bonn, Germany; D. Mendeléeff, St. Petersburg, Russia; Henri Moissan, Paris, France; Edward W. Morley, Cleveland, Ohio; Wilhelm Ostwald, Leipzig, Germany; J. S. Stas, Brussels, Belgium; J. H. van't

Hoff, Berlin, Germany; A. W. Williamson, Haslemere, England; and Friedrich Woehler, Göttingen, Germany.

In addition to these, the following named persons have been nominated for election to honorary membership at the twenty-fifth anniversary meeting: Henry E. Roscoe, London, England; William Ramsay, London, England; Emil Fischer, Berlin, Germany; Adolph von Baeyer, Munich, Germany; and George Lunge, Zürich, Switzerland.

The present list of life members and life associates is as follows:

Life Members—Charles F. Chandler, Charles B. Dudley, W. M. Habirshaw, Harwood Huntington, Morris Loeb, Wm. P. Mason, Charles E. Munroe, Elihu Thomson, and Elwyn Waller.

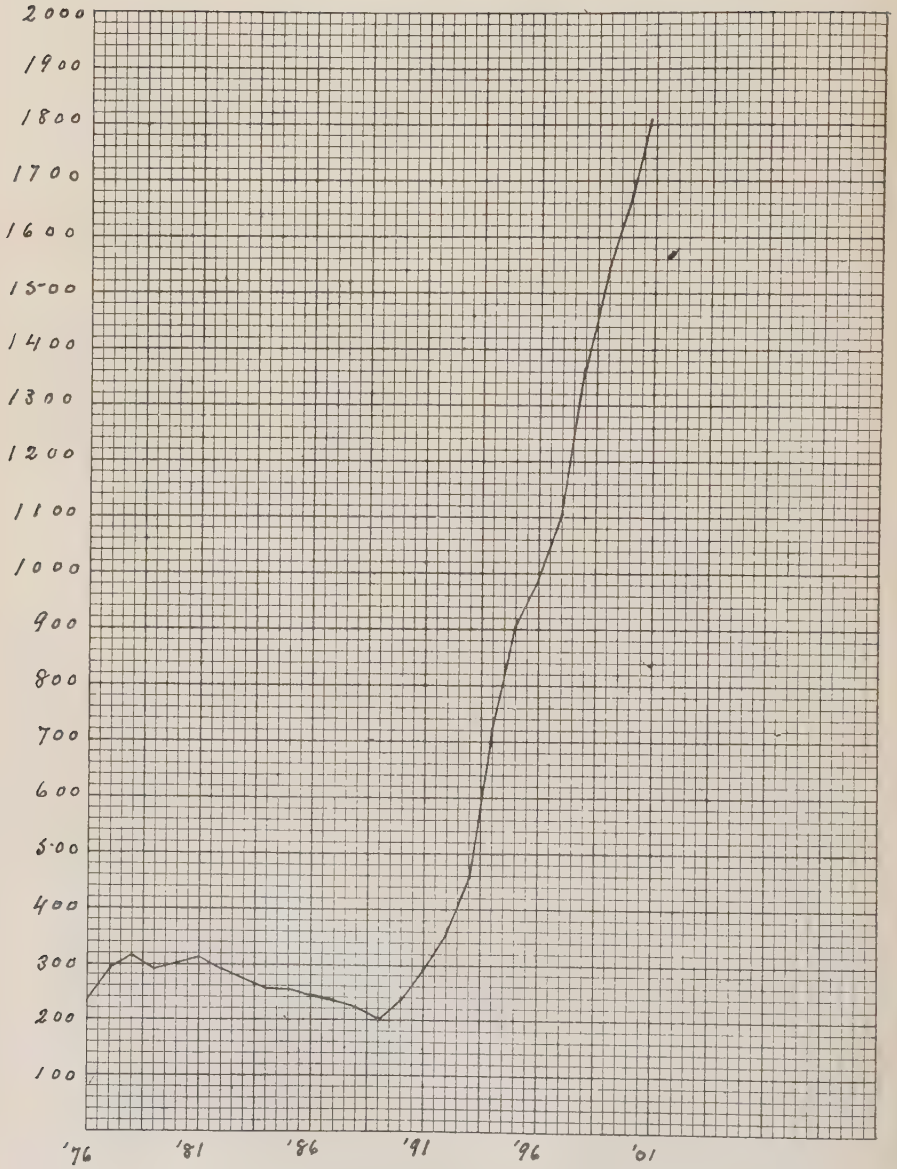
Life Associates—Adolph Kuttroff, W. P. Prentice, and Charles H. Senff.

The total membership at the present time is 1809, distributed as follows:

Members	1,662
Life members	9
Honorary members	15
Associates	120
Life associates	3
	1,809

The accompanying curve of membership indicates the fluctuations in the total roll of the Society since its organization:

The officers of the Society are a president, one vice-president for each local section, who is the presiding officer of such section, a secretary, a treasurer, an editor, a librarian, seven directors and a council. The directors are the legal representatives of the Society, and as such, under the general direction of the Council, they hold and administer all the property of the Society in trust for its uses. The president, the secretary and the treasurer are directors *ex-officiis*, and the other four directors are chosen by the Council from among their own number, two each year to serve for a period of two years. The Council is the governing body in every matter pertaining to the general management and policy of the Society. The business of the Council is transacted either by correspondence or in sessions held at the general meetings of the Society. In a regular session of the Council ten members consti-



AMERICAN CHEMICAL SOCIETY.
Curve of Membership, 1876–1901.

tute a quorum. The Council is constituted as follows: The president, secretary, treasurer, and editor *ex-officiis*, all past presidents of the Society, twelve councilors-at-large, four of whom are elected by the members of the Society each year to serve for a period of three years; and representative councilors from the local sections. Each local section is entitled to one representative councilor for each 100 members in full standing, or fraction thereof, which it may have. The total number of councilors is 47, distributed as follows:

Ex-officiis	4
Past presidents	13
Councilors-at-large	12
From local sections	18
	47

There are three standing committees of the Society, elected each year by the Council—the Finance Committee, consisting of three members; the Membership Committee, of three members; and the Committee on Papers and Publications, of ten members. The editor is *ex-officio* chairman of the Committee on Papers and Publications, and the other members are chosen to represent the following branches of chemistry: Organic, Inorganic, Analytical, Physical, Agricultural, Industrial, Mineralogical and Geological, Physiological, and Electro-chemistry.

Two general meetings of the Society are held each year, the time and place of each meeting being fixed by the Council. During the past few years the summer meeting has been held in connection with that of Section C (the chemistry section) of the American Association for the Advancement of Science, usually in the last week of August. The winter meeting is the annual meeting of the Society, and is held during the winter holiday week. Thus far general meetings have been held as follows:

1. Newport, R. I., August 6 and 7, 1890.
2. Philadelphia, Pa., December 30 and 31, 1890.
3. Washington, D. C., August 17 and 18, 1891.
4. New York, N. Y., December 29 and 30, 1891.
5. Rochester, N. Y., August 16 and 17, 1892.
6. Pittsburg, Pa., December 28 and 29, 1892.
7. Chicago, Ill., August 21 and 22, 1893.
8. Baltimore, Md., December 27 and 28, 1893.

9. Brooklyn, N. Y., August 15 and 16, 1894.
10. Boston and Cambridge, Mass., December 27 and 28, 1894.
11. Springfield, Mass., August 27 and 28, 1895.
12. Cleveland, O., December 30 and 31, 1895.
13. Buffalo, N. Y., August 21 and 22, 1896.
14. Troy, N. Y., December 29 and 30, 1896.
15. Detroit, Mich., August 9 and 10, 1897.
16. Washington, D. C., December 29 and 30, 1897.
17. Boston, Mass., August 22 and 23, 1898.
18. New York, N. Y., December 28 and 29, 1898.
19. Columbus, O., August 21 and 22, 1899.
20. New Haven, Conn., December 27 and 28, 1899.
21. New York, N. Y., June 25 and 26, 1900.
22. Chicago, Ill., December 27 and 28, 1900.

The twenty-fifth anniversary meeting, now in progress, is regarded as the twenty-third general meeting of the Society.

Local sections of the Society may be established by the Council on receipt of a written request to that effect signed by twenty members of the Society residing in the territory within which the local section is desired. Such sections appoint their own officers and committees, and may make any rules for their own government not inconsistent with the constitution and by-laws of the Society. They report annually to the secretary of the Society on or before the 15th of October, giving an outline of the work done during the year and their statistics of membership with officers and standing committees. They may receive for any year from the treasurer of the Society, for their local uses, a sum not to exceed one-third of the amount of the dues paid by the members of said section during the year. The presiding officer of each section is *ex-officio* a vice-president of the Society. Each local section must select some place as headquarters, and a definite territory to be benefited by said section, within which its members must reside. Both headquarters and territory are subject to the approval of the Council. The following is a list of the local sections already established, with headquarters, officers, etc.

RHODE ISLAND SECTION.

Chartered 1891.

Territory—The State of Rhode Island.

Headquarters—Providence, R. I.

Presiding Officer—W. M. Saunders, 20 Dewey St., Olneyville, R. I.

Secretary—Walter E. Smith, 47 Jenkins St., Providence, R. I.

CINCINNATI SECTION.

Chartered 1891.

Territory—The territory covered by a 75-mile radius from Cincinnati, except that where the territory of the Cincinnati and Columbus Sections would overlap, the Cincinnati Section shall have a radius of 50 miles, and the Columbus Section the rest.

Headquarters—Cincinnati, O.

Presiding Officer—Wm. H. Crane, 20 W. 9th St., Cincinnati, O.

Secretary—Frank I. Shepherd, Univ. of Cincinnati, Cincinnati, O.

NEW YORK SECTION.

Chartered 1891.

Territory—The territory covered by a radius of 50 miles from the New York City Hall.

Headquarters—New York City.

Presiding Officer—Charles A. Doremus, 17 Lexington Ave., N. Y. City.

Secretary—Durand Woodman, 127 Pearl St., N. Y. City.

WASHINGTON SECTION.

Chartered 1893.

Territory—The District of Columbia, the State of Maryland, and the State of Virginia east of the 79th meridian.

Headquarters—Washington, D. C.

Presiding Officer—V. K. Chesnut, U. S. Dept. of Agr., Washington, D. C.

Secretary—L. S. Munson, U. S. Dept. of Agr., Washington, D. C.

LEHIGH VALLEY SECTION.

Chartered 1893.

Territory—That portion of the Lehigh Valley included between Easton and Mauch Chunk.

Headquarters—Lafayette College, Easton, Pa., and Lehigh University, South Bethlehem, Pa.

Presiding Officer—Joseph W. Richards, Lehigh University, Bethlehem, Pa.

Secretary—R. K. Meade, Lafayette College, Easton, Pa.

CHICAGO SECTION.

Chartered 1895.

Territory—Chicago and suburbs.

Headquarters—Chicago, Ill.

Presiding Officer—Felix Lengfeld, University of Chicago, Chicago, Ill.

Secretary—F. B. Dains, 2421 Dearborn St., Chicago, Ill.

NEBRASKA SECTION.

Chartered 1895.

Territory—The State of Nebraska.

Headquarters—Lincoln, Nebr.

Presiding Officer—H. H. Nicholson, Univ. of Nebraska, Lincoln, Nebr.

Secretary—R. S. Hiltner, Univ. of Nebraska, Lincoln, Nebr.

NORTH CAROLINA SECTION.

Chartered 1896.

Territory—The State of North Carolina.

Headquarters—Raleigh, N. C.

Presiding Officer—B. W. Kilgore, Raleigh, N. C.

Secretary—C. B. Williams, Asst. State Chemist, Raleigh, N. C.

COLUMBUS SECTION.

Chartered 1897.

Territory—The territory covered by a 75-mile radius from Columbus, except that where the territory of the Cincinnati and Columbus Sections would overlap, the Cincinnati Section shall have a radius of 50 miles, and the Columbus Section the rest.

Headquarters—Columbus, O.

Presiding Officer—H. A. Weber, Ohio State University, Columbus, O.

Secretary—W. E. Henderson, Ohio State University, Columbus, O.

NORTH EASTERN SECTION.

Chartered 1898.

Territory—The States of Maine, New Hampshire, Vermont, and Massachusetts.

Headquarters—Boston, Mass.

Presiding Officer—John Alden, Lawrence, Mass.

Secretary—James F. Norris, Mass. Inst. Tech., Boston, Mass.

PHILADELPHIA SECTION.

Chartered 1899.

Territory—The territory covered by a radius of 60 miles from the Philadelphia City Hall, where this does not conflict with the territory of previously existing Sections.

Headquarters—Philadelphia, Pa.

Presiding Officer—H. W. Jayne, 931 N. Broad St., Philadelphia, Pa.

Secretary—F. E. Dodge, care Barrett Mfg. Co., Tucker and Bermuda Sts., Frankford, Philadelphia, Pa.

MICHIGAN SECTION.

Chartered 1899.

Territory—The State of Michigan.

Headquarters—University of Michigan, Ann Arbor, Mich.

Presiding Officer—P. C. Freer, Univ. of Michigan, Ann Arbor, Mich.

Secretary—Alfred H. White, 626 Forest Ave., Ann Arbor, Mich.

KANSAS CITY SECTION.

Chartered 1900.

Territory—The States of Missouri and Kansas between the 93rd and the 98th meridians.

Headquarters—Kansas City, Mo. (710 Wyandotte St.).

Presiding Officer—E. H. S. Bailey, Univ. of Kansas, Lawrence, Kan.

Secretary—Armand R. Miller, M. T. High School, Kansas City, Mo.

About two-thirds of the members of the Society are connected with these local sections. As a rule, the meetings of the local sections are held at their headquarters once a month.

The regular annual dues of members and associates are $5.00, payable January first, in advance. There is no initiation fee, and no other dues are required of the members. The dues from life members and life associates are invested in a "Life Membership Fund," which is held in perpetuity to guarantee the interests

of the life members. Any income from this fund not required for this purpose is set aside as a "Research Fund," from which appropriations may be made annually by the Council, but only for the purpose of chemical research. The invested life membership fund at present amounts to $1,754.52; the research fund to $31.98. No appropriation has yet been made from the research fund, the amount available being as yet inconsiderable.

The Society publishes a monthly Journal containing papers read at the general meetings and the meetings of the sections, and also other papers which have been submitted to the Committee on Papers and Publications, and have received their approval. The Journal also contains the Review of American Chemical Research, and the Proceedings of the Society and its local sections. The papers published in the Journal are freely abstracted by foreign scientific periodicals, and not infrequently copied entire in their columns. The Journal is sent free to all members and associates not in arrears for dues, and has a long list of subscribers and exchanges, the regular edition being 2,500 copies. The volume for 1900 contained 836 pages of papers, 196 pages of the Review of American Chemical Research, and 128 pages of Proceedings; a total of 1160 pages.

LIST OF OFFICERS AND GENERAL MEETINGS OF THE AMERICAN CHEMICAL SOCIETY.

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1876	New York City. (Monthly meetings.)	John W. Draper.	J. Lawrence Smith, Frederick A. Genth, Eugene W. Hilgard, J. W. Mallet, Charles F. Chandler, Henry Morton.	George F. Barker, (Cor. Sec.) Isidor Walz, (Rec. Sec.)	W. M. Habirshaw.	P. Casamajor.		230
1877	New York City. (Monthly meetings.)	J. Lawrence Smith.	C. F. Chandler, Henry Morton, Silas H. Douglas, Chas. A. Goessmann, T. Sterry Hunt, S. W. Johnson.	George F. Barker, (Cor. Sec.) Isidor Walz, (Rec. Sec.)	W. M. Habirshaw.	P. Casamajor.		289
1878	New York City. (Monthly meetings.)	S. W. Johnson.	B. Silliman, J. C. Booth, H. Draper, G. F. Barker, P. Casamajor, C. F. Chandler.	Henry Morton, (Cor. Sec.) M. Alsberg, (Rec. Sec.)	W. M. Habirshaw.	E. Waller.		315
1879	New York City. (Monthly meetings.)	T. Sterry Hunt.	F. A. Genth, A. B. Prescott, Ira Remsen, A. R. Leeds, E. R. Squibb, W. M. Habirshaw.	P. Casamajor, (Cor. Sec.) S. A. Goldschmidt, (Rec. Sec.)	W. H. Nichols.	Elwyn Waller.	H. Endemann.	289

LIST OF OFFICERS AND GENERAL MEETINGS—(*Continued*).

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer	Librarian.	Editor.	No. of members.
1880	New York City. (Monthly meetings.)	F. A. Genth.	C. F. Chandler, J. W. Mallet, T. G. Wormley, Ira Remsen, A. R. Leeds, E. R. Squibb.	P. Casamajor, (Cor. Sec.) Arthur H. Elliott, (Rec. Sec.)	W. H. Nichols.	Elwyn Waller.	Gid. E. Moore.	
1881	New York City. (Monthly meetings.)	Chas. F. Chandler.	A. R. Leeds, E. R. Squibb, Henry Morton, G. A. Koenig, C. A. Goessmann, Ira Remsen.	P. Casamajor, (Cor. Sec.) Jas. H. Stebbins, Jr., (Rec. Sec.)	W. H. Nichols.	Elwyn Waller.	H. Endemann.	314
1882	New York City. (Monthly meetings.)	J. W. Mallet.	A. R. Leeds, W. M. Habirshaw, E. Waller, A. B. Prescott, C. A. Goessmann, N. T. Lupton.	P. Casamajor, (Cor. Sec.) Jas. H. Stebbins, Jr., (Rec. Sec.)	T. O'C. Sloane.	Geo. A. Prochazka.		293
1883	New York City. (Monthly meetings.)	J. C. Booth.	James H. Stebbins, Jr., A. R. Leeds, C. F. Chandler, Arno Behr, P. Schweitzer, N. T. Lupton.	P. Casamajor, (Cor. Sec.) Thos. S. Gladding, (Rec. Sec.)	T. O'C. Sloane.	Geo. A. Prochazka.		

LIST OF OFFICERS AND GENERAL MEETINGS—(*Continued*).

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1884	New York City. (Monthly meetings.)	James C. Booth.	A. R. Leeds, A. A. Breneman, E. Waller, J. H. Appleton, T. G. Wormley, A. B. Prescott.	P. Casamajor, (Cor. Sec.) C. E. Munsell, (Rec. Sec.)	T. O'C. Sloane.	William Rupp.	A. A. Breneman.	256
1885	New York City. (Monthly meetings.)	James C. Booth.	A. R. Leeds, A. A. Breneman, H. Endemann, Arno Behr, A. B. Prescott, T. G. Wormley.	P. Casamajor, (Cor. Sec.) C. E. Munsell, (Rec. Sec.)	T. O'C. Sloane.	William Rupp.	A. A. Breneman.	255
1886	New York City. (Monthly meetings.)	Albert B. Prescott.	A. R. Leeds, A. A. Breneman, H. Endemann, T. Sterry Hunt, H. B. Nason, T. G. Wormley.	P. Casamajor, (Cor. Sec.) C. E. Munsell, (Rec. Sec.)	T. O'C. Sloane.	William Rupp.	A. A. Breneman.	241
1887	New York City. (Monthly meetings.)	C. A. Goessmann.	A. R. Leeds, A. A. Breneman, E. Waller, T. S. Hunt, J. C. Booth, A. B. Prescott.	P. Casamajor, (Cor. Sec.) T. D. O'Connor, (Rec. Sec.)	J. H. Stebbins, Jr.	William Rupp.	A. A. Breneman	237

LIST OF OFFICERS AND GENERAL MEETINGS—(*Continued*).

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1888	New York City. (Monthly meetings.)	T. Sterry Hunt.	J. C. Booth, W. P. Mason, A. B. Prescott, E. Waller, A. A. Breneman, A. R. Leeds.	M. Alsberg, (Cor. Sec.) T. D. O'Connor, (Rec. Sec.)	J. H. Stebbins, Jr.	William Rupp.	A. A. Breneman.	224
1889	New York City. (Monthly meetings.)	C. F. Chandler.	C. E. Munroe, W. P. Mason, J. W. Mallet, A. A. Breneman, A. C. Hale, T. Sterry Hunt.	M. Alsberg, (Cor. Sec.) Durand Woodman, (Rec. Sec.)	J. H. Stebbins, Jr.	William Rupp.	A. A. Breneman.	204
1890	Newport, R. I. (August 6th and 7th.) Philadelphia, Pa. (Dec. 30th and 31st) New York City. (Monthly meetings.)	H. B. Nason.	A. A. Breneman, C. F. Chandler, Elwyn Waller, C. E. Munroe, G. A. Koenig, A. B. Prescott.	Albert C. Hale, (Cor. Sec.) Durand Woodman, (Rec. Sec.)	F. T. King.	William Rupp.	A. A. Breneman.	238
1891	Washington, D. C. (Aug. 17th and 18th.) New York City. (Dec. 29th and 30th.) New York City. (Monthly meetings.)	George F. Barker.	C. E. Munroe, C. F. Chandler, A. A. Breneman, Elwyn Waller, Edward Hart, F. A. Genth.	Albert C. Hale, (Cor. Sec.) Durand Woodman, (Rec. Sec.)	F. T. King.	William Rupp.	A. A. Breneman.	293

LIST OF OFFICERS AND GENERAL MEETINGS—(*Continued*).

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1892	Rochester, N. Y. (Aug. 16th and 17th.) Pittsburg, Pa. (Dec. 28th and 29th.) New York City. (Monthly meetings.)	G. C. Caldwell.	A. A. Breneman, C. B. Dudley, Edward Hart, A. R. Leeds, Elwyn Waller, E. S. Wood.	Albert C. Hale, (Cor. Sec.) Durand Woodman, (Rec. Sec.)	C. F. McKenna.	C. E. Munsell, Succeeded by F. E. Dodge.	A. A. Breneman.	352
1893	Chicago, Ill. (Aug. 21st and 22nd.) Baltimore, Md. (Dec. 27th and 28th.)	H. W. Wiley.	J. H. Appleton, C. R. Stuntz, A. H. Sabin, F. P. Dewey.	Albert C. Hale, (Gen. Sec.)	C. F. McKenna.	F. E. Dodge.	Edward Hart.	459
1894	Brooklyn, N. Y. (Aug. 15th and 16th.) Boston and Cambridge, Mass. (Dec. 27th and 28th.)	H. W. Wiley.	Chas. A. Catlin, J. U. Lloyd, Peter T. Austen, W. H. Seaman, W. H. Chandler.	Albert C. Hale, (Gen. Sec.)	C. F. McKenna.	F. E. Dodge.	Edward Hart.	722
1895	Springfield, Mass. (Aug. 27th and 28th.) Cleveland, O. (Dec. 30th and 31st.)	E. F. Smith.	Chas. A. Catlin, Karl Langenbeck, Peter T. Austen, Chas. E. Munroe, Edward Hart, A. L. Metz, H. H. Nicholson, Frank Julian.	Albert C. Hale, (Gen. Sec.)	C. F. McKenna.	F. E. Dodge.	Edward Hart.	903

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1896	Buffalo, N. Y. (Aug. 21st and 22nd.) Troy, N. Y. (Dec. 29th and 30th.)	Charles B. Dudley.	Chas. A. Catlin, E. Twitchell, Peter T. Austen, E. A. de Schweinitz, A. L. Colby, A. L. Metz, H. H. Nicholson, Frank Julian, F. P. Venable.	Albert C. Hale, (Gen. Sec.)	C. F. McKenna.	F. E. Dodge.	Edward Hart.	984
1897	Detroit, Mich. (Aug. 9th and 10th.) Washington, D. C. (Dec. 29th and 30th.)	Charles B. Dudley.	Edward D. Pearce, W. L. Dudley, Wm. McMurtrie, W. D. Bigelow, J. W. Richards, A. L. Metz, H. H. Nicholson, Wm. Hoskins, F. P. Venable.	Albert C. Hale, (Gen. Sec.)	C. F. McKenna.	F. E. Dodge.	Edward Hart.	1106
1898	Boston, Mass. (Aug. 22nd and 23rd.) New York City. (Dec. 28th and 29th.)	Charles E. Munroe.	Edward D. Pearce, O. W. Martin, Wm. McMurtrie, Henry N. Stokes, J. W. Richards, H. H. Nicholson, F. P. Venable, J. P. Grabfield, H. A. Weber, Arthur A. Noyes.	Albert C. Hale.	C. F. McKenna.	F. E. Dodge, Succeeded by Marston T. Bogert.	Edward Hart.	1364

Year.	Place of meeting.	President.	Vice-presidents.	Secretary.	Treasurer.	Librarian.	Editor.	No. of members.
1899	Columbus, O. (Aug. 21st and 22nd.) New Haven, Conn. (Dec. 27th and 28th.)	Edward W. Morley.	Edward D. Pearce, Wm. Simonson, Charles F. McKenna, Henry N. Stokes, J. W. Richards, C. E. Linebarger, H. H. Nicholson, Charles Baskerville, H. A. Weber, Arthur A. Noyes, H. W. Jayne.	Albert C. Hale.	C. F. McKenna, Succeeded by Albert P. Hallock.	Marston T. Bogert, Succeeded by A. A. Breneman, (Acting Libr.).	Edward Hart.	1544
1900	New York City. (June 25th and 26th.) Chicago, Ill. (Dec. 27th and 28th.)	Wm. McMurtrie.	W. M. Saunders, Thomas Evans, Charles A. Doremus, H. Carrington Bolton, J. W. Richards, W. R. Smith, H. H. Nicholson, B. W. Kilgore, H. A. Weber, A. D. Little, H. W. Jayne, A. B. Prescott.	Albert C. Hale.	Albert P. Hallock.	E. G. Love.	Edward Hart.	1679
1901	New York City. 25th anniversary. (April 12th and 13th.)	F. W. Clarke.	W. M. Saunders, Charles A. Doremus, Wm. H. Crane, Victor K. Chesnut, Joseph W. Richards, Felix Lengfeld, H. H. Nicholson, B. W. Kilgore, H. A. Weber, John Alden, H. W. Jayne, P. C. Freer, E. H. S. Bailey.	Albert C. Hale.	Albert P. Hallock.	E. G. Love.	Edward Hart.	1809 (Apr. 12, 1901)

ORGANIZATION AND DEVELOPMENT OF THE CHEMICAL SECTION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY MARCUS BENJAMIN.

In the reorganization of the American Chemical Society that took place in 1891, there were three important elements. The first and most conspicuous was naturally the American Chemical Society, which had been organized in New York City in 1876, and while national in name was largely local in character, its policy being dominated by residents of the metropolis ; second, the Chemical Section of the American Association for the Advancement of Science, which was national in character and by far the most representative body of chemists in the United States ; and third, the Chemical Society of Washington, a small, but important, band of working chemists, who followed their profession in various government offices, and who had deemed it wise in 1884 to organize for their mutual benefit.

The preparation of a brief historical account of the second of these organizations, the Chemical Section of the American Association for the Advancement of Science, has been assigned to the present writer for presentation at the twenty-fifth anniversary of the American Chemical Society.

The exceptional character of the Portland meeting of the American Association for the Advancement of Science has long been recognized, and it stands out conspicuously from among its associates as a meeting that was phenomenally successful, not only for its scientific features, but for its social features as well. The annual volume of that meeting, while considerably larger than either that of the year previous or of the year following, does not reveal any conspicuous reason why this gathering should be so frequently referred to, and the opinion has grown that the explanation lies in the character of the members present on that occasion. It is beyond dispute that the little group of young and enthusiastic chemists who were there have since come to occupy a front place among American chemists.

In the table of contents of the Proceedings for 1872 under the

heading of "Physics and Chemistry," there are recorded but five communications, and of these only two can be construed to be of a chemical nature. They are, "On Zonochlorite, a New Hydrous Silicate from Neepigon Bay," by A. E. Foote, and "On Soil Analyses and their Utility," by Eugene W. Hilgard. It was in that year that the brilliant J. Lawrence Smith, one of America's most distinguished chemists, presided over the meeting, and perhaps the honor thus conferred—indeed for the first time—on a representative of the then comparatively modest science of chemistry, may be the reason why a greater number of chemists were induced to gather at the meeting a year later. The table of contents of the Proceedings for 1873 shows a separate heading for "Chemistry," under which are given the titles of six papers, or more than for "Physics and Chemistry" combined in the volume for 1872. In addition, F. W. Clarke and H. W. Wiley presented papers, the titles of which only are given.

Among the chemists present at the Portland meeting were F. W. Clarke, S. A. Lattimore, William McMurtrie, Charles E. Munroe, Robert B. Warder, and H. W. Wiley, all of whom have since presided over the chemical section. These gentlemen, with others, believing that the time was ripe for a more favorable recognition of the science, which they represented, met on the evening of August 26th under the chairmanship of Professor Lattimore, and presented laboratory notes and informal papers which were so satisfactory that at the close of the sessions of Section A, an informal meeting was held by the chemists to consider the matter of a proper organization of a chemical subsection at the next meeting, and resolutions were adopted to be presented to the standing committee at the Hartford meeting.[1]

This was the initial action in the movement that led to the formation of the Chemical Section of the American Association.

At the Hartford meeting in 1874, the section, or subsection as it was then called, came into actual existence. According to the report of the general secretary, "the request of the chemists for the formation of a permanent subsection of chemistry was referred to the standing committee." The action of the standing committee is not given in the published executive proceedings of the meeting, but in the report of the permanent secretary it appears that "Section A was organized on Wednesday and con-

[1] Proc. A. A. A. S., **22**, 424.

tinued its sessions until the Tuesday evening following, giving off a subsection of chemistry on Monday, August 17th, which also adjourned on Tuesday after making preparations for its permanent organization at future meetings.'' Elsewhere in his report, Professor Putnam says ''the formation of a permanent subsection of chemistry (and the organization of the Entomological Club) accomplished at the meeting, are so fully in accordance with the objects of the association in bringing together scientists in all departments, that this expression on the part of two special branches can only be regarded as most favorable towards the annual centralizations of scientific thought in the country during the association week, and it cannot be long before the American Association will draw within its folds, like the British Association, many special organizations now existing, which would be benefited by a union with the association, and working for one common end would thus still more greatly aid in the advancement of science in America.''[1]

Fully twenty-five papers on chemical subjects were presented at the Hartford meeting, and of these, eight are published in the Proceedings, including several communications of J. Lawrence Smith and T. Sterry Hunt, and one each from Charles B. Dudley and A. P. S. Stuart. Among the authors whose papers are mentioned by title only are A. A. Breneman, H. Carmichael, F. W. Clarke, Benjamin S. Hedrick, S. W. Johnson, William McMurtrie, and P. H. Van der Weyde. The subsection presented the name of Samuel W. Johnson for its first chairman, which was confirmed. The newly organized subsection was a strong one from its inception.

In 1875 the association met in Detroit and after Professor Johnson had called the subsection to order, Frank W. Clarke was chosen as its first secretary. Papers by F. W. Clarke, John W. Langley, Thomas C. Mendenhall, Albert B. Prescott, and S. M. Stevens are contained in the annual volume of the Proceedings, while titles of unpublished communications are credited to George F. Barker, Samuel W. Johnson, Albert R. Leeds, and J. Lawrence Smith.

No address by the chairman appears to have been delivered at this meeting, but a resolution was adopted by which it was made ''the duty of the chairman of the subsection of chemistry to pre-

[1] Proc. A. A. A. S., **22**, 424.

pare an address'' for the subsequent meeting. The subsection presented the names of George F. Barker as chairman, and H. Carrington Bolton as secretary, which were subsequently confirmed by the standing committee.

The association met in Buffalo in 1876, and continued its organization with increased attendance and interest. The able opening address of Professor Barker on ''The Molecule and the Atom'' ''called and retained many attendants from the other sections.'' In beginning his address he alluded to the formation of the American Chemical Society, which he described as an event ''which is of especial interest to the members of this section,'' and in a spirit almost of prophecy said : ''The most agreeable relations exist between the Society and this subsection. To continue these relations it might be desirable to hold the August meeting of the Society jointly with that of this subsection of the American Association.'' Many years were to elapse before the consummation of this much-desired result.

Nearly twenty papers were read before the subsection, and of these, five are printed in the Proceedings, while the others were, for the most part, printed in full in the *American Chemist* for November and December, 1876. Among the names of those who presented communications may be mentioned Frank A. Gooch, N. T. Lupton, Edward W. Morley, and S. P. Sadtler.

It had been voted in 1860 to hold the meeting for the year following in Nashville, but the unfortunate events that followed prevented the association from meeting in the south, and it was not until 1877 that it was possible for the association to meet in Nashville, to which place renewed invitations had been presented. Notwithstanding the fact that the meeting was held in August, the attendance was a fairly large one, especially from among residents of the south. The chemical section on this occasion met under the chairmanship of N. T. Lupton, and with Paul Schweitzer as secretary. The meeting of the section was opened with brief remarks by the chairman and no formal address appears to have been presented. Among the papers presented there were three that are published in the Proceedings, two of which are by F. P. Dunnington, and one by Paul Schweitzer. Eleven papers are recorded by title, and in addition to six by J. Lawrence Smith, there are communications from Arthur H. Elliott, C. Leo Mees, and Alfred Springer.

In 1878 the association gathered in St. Louis, and on that occasion F. W. Clarke, who had been chosen chairman of the subsection, presented an opening address, in which he pleaded for the endowment of laboratories of research. The practice of electing the secretary from among those who were present at the meeting seems to have been continued, and for the St. Louis meeting A. P. S. Stuart was chosen. Eight papers only appear to have been presented before the subsection, and of these, four appear in the published Proceedings. It is interesting in this connection to recall the fact that of the papers published one by J. Lawrence Smith is "A Short Account of the Nature of the Oxide of the New Element Mosandrum." The presentation of the discovery of a new element by an American chemist and announced before an association of American chemists was an event of the very highest importance, and it is only to be regretted that subsequent investigations failed to confirm the elementary nature of the earth. The titles of papers read but not published include several by F. W. Clarke, especially those on specific gravity determinations, which subsequently were published in the *American Journal of Science.*

A year later Saratoga was the meeting place of the American Association, and on that occasion the officers were Ira Remsen, chairman, and William Ripley Nichols, secretary. The address of Professor Remsen was an appeal for the study of organic chemistry, contending that in the educational institutions in this country the pursuit of that branch of chemistry had been sadly neglected. Papers were presented by Clarke, Leeds, McMurtrie, Morley, and Wiley, which are printed, either in full or in abstract, in the Proceedings, and thirteen titles of other papers that were read before the subsection appear by Breneman, W. L. Dudley, Nichols, and Wiley. Professor Remsen was unable to be present at that meeting, and Professor Clarke, was, by the action of the subsection, continued as its chairman.

In 1880 the American Association met in Boston, and while the meeting as a whole was a most successful one, the success of the subsection of chemistry was preeminent. John M. Ordway presided, and in his opening address "gracefully surveyed the experiences of the past, the needs of the present, and the prospects of the future of chemistry." Charles E. Munroe, who had been active in the subsection since its inception, served as secre-

tary. Nearly forty papers were presented, of which number twenty appeared, either in full or in part, in the Proceedings. These facts are significant, for by instituting a comparison it could be readily shown that in the few years that elapsed since the subsection of chemistry had been organized it had steadily grown until it had reached a standing in which it rivaled the full sections so far as the number of papers presented and attendance were concerned. It is also desirable to record that at this meeting the chemists who were members of the standing committees secured the passage of a resolution congratulating the aged Chevreul on the ninety-fifth anniversary of his birthday, and a cablegram was sent with the hearty congratulations of the American Association for the Advancement of Science and expressing "the hope that his life and his labors may be prolonged at least to the full century." Another interesting feature of the meeting was the gathering of the chemists at a subscription dinner held under the auspices of the American Chemical Society. A meeting of the Association of Agricultural Chemists was held at a convenient time during the meeting of the association. The subsection could not but feel that to a certain extent it shared in the honor that had been conferred upon Professor Barker in his elevation to the presidency, for notwithstanding his devotion to physics he has never forgotten that chemistry was his first love.

The meeting in Boston was naturally followed by one in the west, and the influence of President Clarke unquestionably led to the selection of Cincinnati as the place for the gathering in 1881. In consequence of the absence of William Ripley Nichols, who had been selected to preside over the subsection, due to serious illness, no address was presented at this meeting, and George C. Caldwell was chosen as chairman of the subsection. Alfred Springer served as secretary in place of R. W. Warder, who had been chosen to fill the office but was unable to be present. The success of the Boston meeting was repeated in Cincinnati, and upwards of thirty papers were presented before the subsection, of which number abstracts of eleven appear in the volume of printed Proceedings. As this was the last meeting of the subsection it may be worth while to call attention to the fact that during the six years of its existence it had chosen for its presiding officers distinguished chemists who were connected with the faculties of Yale University, University of Pennsylvania,

University of Nashville, University of Cincinnati, Johns Hopkins University, Massachusetts Institute of Technology, and Cornell University. It had grown steadily in strength until it rivaled the oldest sections in the number of papers presented before it, and the nucleus of five or six which had gathered in Portland had grown until several hundred members acknowledged their allegiance to the subsection. Its influence was very great, and in all matters pertaining to the advancement of American science the opinion of chemists was receiving more and more consideration.

In 1882 the American Association met in Montreal. The constitution which had been amended at the Cincinnati meeting went into effect. It provided for nine sections, each of which was to be presided over by a chairman with the rank of vice-president. The third of these sections, now best known as Section C, was devoted to chemistry. H. Carrington Bolton, who had organized in 1874 the gathering of chemists in Northumberland, Pennsylvania, to commemorate the discovery of oxygen by Priestley, presided over the section, and Alfred Springer served as secretary. The opening address was on "Chemical Literature," and in closing Dr. Bolton suggested the desirability of having a committee to devise a plan for the proper indexing of the literature of the chemical elements. Subsequently, such a committee consisting of H. C. Bolton, Ira Remsen, F. W. Clarke, A. A. Julien, and A. R. Leeds, was authorized by the standing committee, and has since continued in existence. It will not be necessary to refer to the excellent work that this committee has done, but I am sure the members of the Chemical Society recognize the splendid results that have been attained, especially in the cooperation of the Smithsonian Institution, which later, upon the solicitation of Dr. Bolton, agreed to publish such bibliographies as should receive the approval of the committee. Twenty-nine papers were presented before the section at this meeting, of which number the abstracts of fourteen appear in the volume of Proceedings. At this meeting a number of foreign visitors were present, and among these Dr. (subsequently Sir) John W. Gilbert, of Rothamsted, was in attendance at the chemical section. Dr. Gilbert presented a paper before the section on "The Sources of Nitrogen in the Soil," and the section made a request of the standing committee for a committee to petition the Agricultural

Departments of the United States or Canada to print this communication, which was granted.

The meeting of the American Association in 1883 was held in Minneapolis, and for that meeting E. W. Morley was chosen president of the chemical section, and J. W. Langley, secretary, but as Professor Langley was only able to be present for a part of the time, W. McMurtrie succeeded him. No presidential address appears to have been delivered, but the titles of eleven papers are recorded in the Proceedings, of which number nine are given in abstract. The first report of the committee on the indexing of the literature of chemical elements appears in this volume, and mention is made in it that the Smithsonian Institution agreed to distribute, free of expense, all the circulars in furtherance of the work of the committee. No business of special interest to chemists appears in the record of the executive proceedings.

Subsequent to the meeting in Boston the Association met in the west and in the north, so that it was not until 1884 that it again returned to the east, and for a second time in its history met in Philadelphia. John W. Langley presided over the chemical section, and delivered an address on "The Development of Theories Concerning the Nature and Fundamental Causes of Chemical Phenomena." R. B. Warder had been elected secretary, but was unable to be present, and Henry Carmichael was chosen to fill his place. At this meeting, twenty-eight papers were presented before the section, of which number fifteen appear in the Proceedings. This meeting, which was very well attended, was interesting on account of the number of foreign guests who had been specially invited to attend, and among these the chemists had the honor of welcoming James Dewar, whose name has since become famous on account of his studies of low temperatures. On this occasion he represented the Royal Institute of Great Britain.

The meeting of the American Association was held in Ann Arbor, in 1885, and for that occasion William Ripley Nichols had been chosen to preside over the chemical section, but the condition of failing health, which soon led to his untimely death, prevented his presence at that meeting, in consequence of which N. T. Lupton presided over the section, and F. P. Dunnington served as secretary. Notwithstanding his illness, Professor

Nichols presented an address on "Chemistry in the Service of Public Health," which was read for him before the section. Twenty papers were presented before the section, of which number all but three appear, either in full or by abstract, in the volume of the Proceedings.

In 1886, for the third time in its history, the association met in Buffalo. For this meeting, Harvey W. Wiley was chosen to preside over Section C, and William McMurtrie served as secretary. Dr. Wiley presented an opening address on "The Economic Aspects of Agricultural Chemistry," and thirty papers were read before the section, which appear by title only in the annual volume of the Proceedings. It was at this meeting that the section on chemistry presented the name of Michel Eugene Chevreul to the standing committee, requesting that he be made an honorary fellow of the association. This nomination was enthusiastically confirmed by the association in a general meeting, and a cable despatch sent him announcing his election and congratulating him on the approaching one hundredth anniversary of his birthday. Also at this meeting a committee from the Washington Chemical Society presented a report on "Methods of Stating Water Analyses," which resulted in the appointment of a committee to consider and report a scheme for a uniform method of stating the analyses of mineral and potable waters.

In 1887 the association met in New York with Albert B. Prescott as vice-president of Section C, and C. F. Mabery as secretary. The opening address by Professor Prescott was on "The Chemistry of Nitrogen as Disclosed in the Constitution of Alkaloids." Over forty papers were presented before the section, of which abstracts of thirty-five are given in the annual volume of the Proceedings. In addition to the papers, the Committee on Methods of Stating Water Analyses reported a scheme which received the approval of the section. The New York meeting stands out conspicuously from its fellows as one at which there was a large attendance of chemists, and as the excursions provided for the visiting scientists were for the most part by boat along the water front and to the harbor, excellent opportunities were afforded for the renewal of old acquaintances.

The association in 1888 held its second meeting in Cleveland, and Section C met with Charles E. Munroe as its presiding officer and William L. Dudley as its secretary. Professor Munroe

delivered an address at the beginning of the meeting on "Some Phases in the Progress of Chemistry." Twenty-two papers were presented before the section, of which number fifteen appeared in the volume of the Proceedings. The section at this meeting honored itself by recommending the name of Dr. Frederick A. Genth to the standing committee for election as an honorary fellow. This eminent chemist, it will be remembered, had been somewhat summarily removed from his chair at the University of Pennsylvania, and the chemical section desired to place on record its appreciation of his distinguished services to science by this action. At this meeting the section recommended to the Council the appointment of a Committee on the Formation of a National Chemical Organization, which action was recommended to the association, and subsequently a committee, consisting of A. B. Prescott, Alfred Springer, and Edward Hart, was appointed. This important action was the beginning of the movement in consequence of which the influence of the chemists of the United States as represented in the Chemical Section of the American Association became active in the formation of the American Chemical Society as reorganized three years later. Committees on Chemistry Teaching and on Water Analyses were also appointed at this meeting as a result of recommendations by the section to the Council.

In response to an urgent invitation from Canadian scientists, the American Association in 1889 met in Toronto. The chemical section was presided over by William L. Dudley, and Edward Hart acted as secretary. Dr. Dudley delivered an address on "The Nature of Amalgams," accompanied by a full index to the literature of that subject. Twenty-one papers were presented before the section, of which number seventeen appeared, in full or in abstract, in the Proceedings. In addition to these papers several reports were submitted before the section. Among these was a preliminary report of the Committee on Spelling and Pronunciation of Chemical Terms. This important committee had as its chairman, Thomas H. Norton. There were also reports from Committees on Chemistry Teaching, of which W. H. Seaman was chairman; on Methods of Analyses of Waters, with statement of results, of which George C. Caldwell was chairman; and of more importance to us on this occasion was the report of the Committee of Conference on the Organization of a

National Chemical Society. This committee consulted with committees of conference appointed by the Society of Official Agricultural Chemists, the American Chemical Society holding meetings in New York, the Washington Chemical Society, and the Chemical Section of the Franklin Institute. The concensus of opinion from these sources was in favor of the formation of a society of American chemists, and that the time for the organization of such a body was near at hand. The essential feature of the report, with which the present article is concerned, was its coordination with the American Association, and concerning this the report said:

"There is but one center accessible enough and attractive enough for the annual meetings of the new society, and this center, not always in the United States, is *always the meeting of the American Association*. To organize for further union, chemists must cherish the growing chemical aggregation in Section C, now of permanent standing and great social advantage, and an alliance with this section, carefully framed for *mutual* benefit, must be fundamental in the new organization."

An order of procedure was recommended, which was as follows:

Whenever the chemical section and the Council may decide that the time has come for provisional organization, it is recommended that the section then nominate and the association appoint a Committee of Organization of a Society of American Chemists, to frame constitution and by-laws, to address chemists and obtain pledges of membership. The committee to be bound by certain instructions to be framed by this association. The membership of the committee as nominated by Section C, to include representatives of the Society of Official Agricultural Chemists, the American Chemical Society holding meetings in New York, the Washington Chemical Society, and the Chemical Section of the Franklin Institute, and the committee to have power to add to its membership from chemists of appointment by local societies, provided that the appointees of this association remain a majority of the voting members of the committee. And that the American Chemical Society holding meetings in New York be invited to submit its constitution and operative laws for the use of the committee, also to yield its name to the new society, and to go forward as the New York Section of the

American Chemical Society, retaining under its corporate control as a section the property and vested rights it now holds.

In 1890 the American Association met in Indianapolis. For that meeting Robert B. Warder had been chosen to preside over Section C, and as he was unable to stay throughout the meeting, Thomas H. Norton was chosen to fill his place. W. A. Noyes acted as secretary. Professor Warder delivered an address on "The Recent Theories of Geometrical Isomerism," with a bibliography. Forty-two papers were presented before the section, all of which, with the exception of two, appear, either in full or in abstract, in the Proceedings. The reports of the committees deserve consideration. Besides the report of the Committee on Indexing Chemical Literature, there is a report of the Committee for Promoting the Use of the Metric System among Physicians and Pharmacists, and one of the Committee on Spelling and Pronunciation of Chemical Terms. Finally there was presented the report of a Committee upon the National Chemical Society, which may be regarded as an appendix to, or continuation of, the very able and conservative document presented before the section in the year previous. It is signed by F. W. Clarke, H. Carrington Bolton, and Edward Hart. It appears from this report that a circular letter signed by F. W. Clarke representing the Chemical Society of Washington, and H. W. Wiley representing the Association of Official Agricultural Chemists, was widely distributed among American chemists. It presented a plan which, in brief, was as follows: To organize a continental chemical society, representative of all North America, by affiliating together as far as possible existing local organizations. The society as a whole to hold an annual meeting at such time and place as may be agreed upon from year to year, while local sections, like the sections of the British Society for Chemical Industry, shall have their regular frequent gatherings in as many scientific centers as possible, all publishing their work in one official journal.

While six chemists definitely opposed the plan, some two hundred and fifty expressed their approval of the general proposition. The report further says that the American Chemical Society, with headquarters in New York, have recently adopted a revised constitution, which provided for the organization of local sections elsewhere, and mentions the general meeting of the American Chemical Society in Newport where the movement for the larger

or national organization was fully discussed with the best of feeling and in the broadest possible spirit. The willingness of the American Chemical Society to meet with the representatives of other chemical organizations and to reorganize on a national basis is evident from the report which concludes with the recommendation that Section C join with the American Chemical Society, the Chemical Society of Washington and other like organizations in calling a conference of chemists to be held at some time during the coming winter, the purpose of such a conference to be the effecting of a plan by means of which "a national organization can best be brought about and the long-desired union of all American chemists made a practical reality." With the presentation of this report the public action of Section C came to an end, although its representatives met later and effected the reorganization of the American Chemical Society, but the details of the methods by which that action was consummated belong properly to the history of the American Chemical Society which has already been presented.

It remains simply for me to say, in closing, that at the meeting of the American Association in Washington, in 1891, Professor Clarke reported on behalf of the Committee on a National Chemical Society that "a conference of representatives of ten organizations had been held. The representatives of the American Chemical Society had indicated a willingness to make the changes in their constitution necessary to adapt it to the requirements of American chemists in general, and a unanimous vote of all delegates present favored a union under the charter of that body." At the Washington meeting a joint meeting of the American Chemical Society and Section C was held, presided over by George F. Barker, and thus was realized the prophecy which he, himself, had voiced at the meeting of the section in 1876.

REPORT OF THE CENSUS COMMITTEE.

[Charles Baskerville, Chairman, Louis Kahlenberg, Charles E. Munroe, William A. Noyes, and Edgar F. Smith.]

GENERAL.

The Census Committee has assumed that its function was to learn as accurately as possible the progress for the last twenty-five years and to see how to better the conditions for the development of chemistry in America. A mere statement of conditions without further comment would hardly secure that end. With that in mind it became necessary to gather statistics of the most varied character. The report is not complete, as members of the committee have been limited in time and means in the performance of a task that assumes enormous proportions. Nevertheless sufficient data have been secured to give cause for much self-gratulation, and at the same time to make American chemists acknowledge frankly their failings, and to indicate directions for much home missionary work.

For the sake of economy the committee has in places referred to special papers dealing with certain problems, as they embody what is urged, a statement of which would be but unnecessary repetition. Silliman's address on the occasion of the celebration of the Centennial of Chemistry in America, from which occasion the American Chemical Society grew, gives an excellent résumé of the chemical work of America up to that time. Our report has not gone so much into detail, as a reprint of the American, and much of the foreign journals would have been necessary. The following blank was sent to the professors of chemistry in every institution of learning in America and Canada.

1. Name of institution,
   Date of founding.
2. Number students in Chemistry, 1876–1901—
   Inorganic,
   Analytical,
   Organic,
   Technical,
   Physical,
   Agricultural.
3. Number students specializing in Chemistry.

4. Number courses offered in Chemistry.
5. Teaching force in Chemistry.
6. Equipment, Chemical Department.
7. Endowment, " "
8. Statements as to floor space, style of building in 1876–1900.
9. Has increase in teaching force, endowments, etc., been commensurate with growth of other departments?
10. Proportion of present teaching force members of the American Chemical Society.
11. Proportion of graduates who are members.
12. Proportion of graduates teaching chemistry alone, or with allied subjects.
13. Proportion of graduates in industries where chemical knowledge was to be utilized.
14. Is the tendency to "go abroad" for finishing work as pronounced with advanced students now as in 1876, or do they move to the larger American universities?
15. Is there much exchange of graduate students for a term or so in American universities?
16. State new fields into which chemistry has entered in your vicinity.
17. Suggest other fields where a chemist would be especially valuable.
18. State what special financial aids were offered students who wished to specialize in chemistry (fellowships, scholarships, etc.), 1876–1901.
19. State approximately percentage and amount of apparatus imported in 1876–1901.
20. State approximately percentage and amount of chemicals imported in 1876–1901.
21. Do you find that you can secure apparatus "made in U. S." of as good grade as formerly imported?
22. What seems to be the intent of manufacturers of apparatus and chemicals in America?
23. Are not most of the dealers mere importers or is there a pronounced movement to make apparatus for the laboratory at home? We somehow make satisfactory apparatus for the manufacturers at home.
24. Do the boards of health, geological surveys (State) and experiment stations make more use of chemists now than twenty-five years ago?
25. About what proportion of students in chemistry turn their attention to pharmacy?
26. Observations upon improved methods of teaching chemistry.
27. Observations upon appreciation of chemists by industries.
28. Remarks and suggestions touching chemistry which might be of service to the committee preparing the census of American chemists for the past twenty-five years.

Replies were received from over 200 colleges including the leading institutions of the United States (Table I). Scarcely half a dozen answers came from Canada and no blanks were sent to Mexico, so the report deals with these United States only.

A glance at Table I shows the enormous increase in the number of students in chemistry (inorganic, analytical, organic, physical and agricultural) during the past twenty-five years. These figures are not altogether to be relied upon on account of estimates in a few cases and misconceptions of the intent of the question by some who furnished data in others. For example, for analytical chemistry the numbers given in some instances refer only to students in quantitative analysis. There were but few laboratories in this country in 1876; none attempt teaching chemistry now without some laboratory equipment.

There has been a marked increase in the number of students specializing in chemistry. The courses have been much diversified by means of increase in the number of instructors, teaching fellows, laboratory assistants, etc. No data were to be had as to the number of graduate chemists or students who have taken the degree of doctor of philosophy.

In regard to equipment, large sums have been spent by many of the institutions, some of which have even been established since the founding of the American Chemical Society. A few chemical departments reported large endowments. While in many cases, through private beneficence, institutions have been provided with commodious, in some instances magnificent, laboratories, as at Yale, Columbia, Pennsylvania, Chicago, Cornell, and Leland Stanford, Jr., and in others as the Universities of Nebraska and Washington, the states have supplied the need in many departments, there is a crying demand for better equipment and greater accommodations. Some few reported their equipment as "sufficient."

An itemized statement of the buildings, floor space, etc., is quite out of the question. A conservative statement, averaging all, is that the accommodations for students and teachers have increased as 1 to 25.

TABLE I.

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
ALABAMA.																			
Southern Univ.,	Greensboro	1859	..	20	..	2	..	20	0	..	0	..	..	..	12	..	4	..	2
[1]Tuskeegee Inst.,	Tuskeegee	1880	..	42	..	42	..	21	0	..	0	..	..	..	0	..	2	..	1
[2]Lafayette College,	Lafayette	1885	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	..
ARKANSAS.																			
Onachita College,	Arkadelphia	1886	..	27	..	5	..	15	0	..	0	..	..	..	4	..	3	..	2
CALIFORNIA.																			
California College,	Oakland	1870	..	2	..	0	..	0	0	..	0	..	..	..	0	..	2	..	1
Pomona College,	Claremont	1888	..	25	..	14	..	8	..	..	..	..	..	..	3	..	4	..	2
Univ. of Pacific,	College Park, San Jose.	1851	..	17	..	3	..	4	0	..	0	..	..	..	..	..	7	1	1
Leland Stanford, Jr., University,	Stanford University	1891	..	199	..	41	..	181	19	..	0	..	..	..	65	..	22	..	9
University of Southern California	University	1880	..	40	..	15	..	25	0	..	0	..	..	..	4	..	12	..	3
COLORADO.																			
[3]School of Mines,	Golden	1874	..	..	..	..	..	..	..	..	..	..	234	0	0	..	1	..	4
CONNECTICUT.																			
Wesleyan Univ.,	Middletown	1831	..	..	..	..	..	.	..	..	..	75	150	..	..	4	11	2	4
[4]Trinity College,	Hartford	1823	..	27	..	2	..	23	0	..	0	..	..	..	0	..	6	..	1
[5]Sheffield Scientific School (Yale),	New Haven	1847	80	199	15	60	15	80	15	6	..	..	..	15	60	..	..	7	12
DELAWARE.																			
State College for Colored Students,	Dover	1890	..	10	..	10	..	..	..	..	..	..	..	..	0	..	1	..	1

[1] Primarily industrial. [2] No courses offered. [3] All students take the one course. [4] No laboratory in 1876. [5] Data do not include Yale University, not furnished.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
DISTRICT OF COLUMBIA.																			
Columbian Univ.,	Washington	1821	57	275	0	12	2	41	3	0	7	..	..	2	41	4	20	1	12
[1]Howard Univ.,	Washington	1867	9	32	..	..	..	8	0	..	0	..	..	0	0	1	2	1	1
FLORIDA.																			
[2]John B. Stetson University,	De Land	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rollins College,	Winter Park	1885	..	20	..	..	.	10	..	..	..	..	..	..	0	..	3	..	3
Florida Agricultural College,	Lake City	1884	..	15	..	2	..	3	0	..	1	..	..	..	3	..	4	..	2
GEORGIA.																			
Atlanta University,	Atlanta	1869	..	18	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Mercer University,	Macon	1837	23	44	..	6	..	17	0	..	0	..	..	0	0	1	4	1	3
Univ. of Georgia,	Athens	1785	37	106	26	7	18	20[3]	13	26	15	..	..	10	13	4	6	1	2
Clark University,	South Atlanta	1870	..	25	..	2	..	24	0	..	0	..	..	..	0	0	3	..	2
IDAHO.																			
Univ. of Idaho,	Moscow	1889	..	40	..	3	..	10	0	..	2	..	..	..	20	..	13	..	2
ILLINOIS.																			
Univ. of Illinois,	Champaign	1867	75	194	0	46	12	66	12	6	13	..	..	20	53	12	30	3	12
Monmouth Coll.,	Monmouth	1856	..	15	..	5	..	12	0	..	0	..	..	0	6	0	5	0	1
Lake Forest Univ.,	Lake Forest	1876[4]	0	15	0	..	0	5	3	..	..	..	..	..	3	..	5	..	1
[5]Knox College,	Galesburg	1837	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Ewing College,	Ewing	1860	0	9	0	0	0	9	0	0	0	..	..	0	0	0	4	0	1
Union Christian College,	Merom	1859	..	9	..	0	..	0	0	..	0	..	..	..	0	1	1	1	1

[1] Medical students not included, 24 in 1876; 193 in 1901. [2] No data. [3] Including experimental (elementary), 66. [4] Academic department opened 1856.
[5] "Chemical department just being developed."

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
ILLINOIS—*Con.*																			
Univ. of Chicago,	Chicago	1892	..	160	..	40	..	110	..	..	..	..	..	..	40	..	30	..	10
[1]Northern Illinois College,	Fulton	1865	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lombard Univ.,	Galesburg	1853	..	45	..	20	..	30	0	..	0	..	..	..	2	..	7	..	1
St. Ignatius Coll.,	Chicago	1869	30	50	28	48	0	0	0	..	0	..	..	2	2	2	2	1	2
Wheaton College,	Wheaton	1860	..	20	..	..	..	12	..	..	..	..	..	..	0	..	1	..	1
Shurtleff College,	Upper Alton	1827	7	16	..	9	..	9	0	0	0	..	..	0	3	1[2]	9	1	1
Greenville College,	Greenville	1892	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..
INDIANA.																			
Indiana Univ.,	Bloomington	1828	..	75	..	30	..	75	12	..	[3]	..	..	..	25	..	32	..	6
Wabash College,	Crawfordsville	1832	..	20	..	2	.	4	0	..	..	..	..	..	2	..	3	..	1
Moores Hill Coll.,	Moores Hill	1854	..	10	..	4	..	6	0	..	..	..	..	..	0	.	2	..	1
Franklin College,	Franklin	1834	..	21	..	0	..	0	0	..	0	..	..	..	0	..	..	..	1
Purdue University,	Lafayette	1874	0	200	0	10	0	20	7	0	6	..	..	0	20	6	18	1	4
Rose Polytechnic Institute,	Terre Haute	1883	..	90	..	9	..	62	6	..	0	..	..	..	16	..	1[4]	..	2
IOWA.																			
State University,	Iowa City	1852	..	..	..	..	..	..	..	..	..	..	300[5]	0	12	1	11	1	7
Iowa College,	Grinnell	1848	..	50	..	5	..	9	5	..	0	..	..	..	0	..	4	..	2
[6]Central Univ.,	Pella	1853	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lenox College,	Hopkinton	1859	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..	..	1
Palmer College,	Legrande	1889	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	1
Drake University,	Des Moines	1881	..	87	..	10	.	28	0	..	0	..	..	..	6	..	5	..	3
Morningside Coll.,	Sioux City	1895	..	26	..	..	..	8	..	..	..	..	..	..	5	.	10	..	1

[1] No work given in chemistry. [2] Taught other subjects at same time. [3] 18 in physiological chemistry. [4] This evidently means "chemical course," *i.e.*, several years required. [5] In all courses. [6] No data.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special Students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
IOWA—*Con.*																			
Penn College,	Oskaloosa	1872	..	28	..	0	..	20	0	..	0	..	..	0	0	0	4	0	2
State College,	Ames	1868	..	200	..	40	..	95	15	..	..	..	..	..	20	8	20	2	3
Simpson College,	Indianola	1867	..	19	..	4	..	3	0	..	0	30	..	0	0	..	4	..	2
KANSAS.																			
Fairmount Coll.,	Wichita	1895	..	20	..	..	..	18	..	..	..	..	..	..	..	..	2	..	1
State Agri'l Coll.,	Manhattan	1863	..	175	..	110	..	91	0	..	14	[1]	..	..	1	4	10	1	3
Ottawa University,	Ottawa	1865	..	49	..	3	..	17	0	..	0	..	..	0	0	..	3	..	1
Washburn College,	Topeka	1865	..	24	..	8	..	4	0	..	0	..	..	..	4	..	5	..	1
Univ. of Kansas,	Lawrence	1864	20	200	2	40	2	165	25	0	0	..	..	0	10	..	22	1	5
St. John's Lutheran College,	Winfield	1894	..	5	..	0	..	1	..	0	0	..	.	..	0	..	2	..	1
Coll. of Emporia,	Emporia	1883	..	18	..	7	..	0	..	0	0	..	..	..	0	..	3	..	1
St. Mary's Coll.,	St. Mary's	1869	0	39	0	0	0	2	0	..	0	..	..	..	0	..	2	..	1
Midland College,	Atchison	1887	..	12	1	0	..	3	0	..	0	..	..	..	0	..	2	..	1
KENTUCKY.																			
Wesleyan College,	Winchester	1868	10	22	0	0	10	18	10	0	0	..	..	0	2	5	5	1	1
Berea College,	Berea	1853	..	25	..	0	..	18	0	..	0	..	..	0	0	0	2	0	1
Center College,	Danville	1819	..	40	..	4	..	10	0	..	0	..	.	..	0	..	5	..	2
Ogden College,	Bowling Green	1877	..	..	..	..	..	..	..	..	..	5	8	..	..	..	..	1	1
LOUISIANA.																			
Tulane University,	New Orleans	1884	..	65	..	10	..	38	0	..	0	..	..	..	0	..	3	..	3
State University,	Baton Rouge	1860	..	83	..	30	..	30	15	..	14	25	..	..	15	..	12	1	[2] 2
[3]Leland University,	New Orleans	1870	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

[1] Fire in 1900 destroyed records. [2] With four student assistants. [3] Nothing.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
MAINE.																			4
Univ. of Maine,	Orono	1868	36	120	3	8	20	128	0	3	3	..	..	6	6	9	28	1	2
Bowdoin College,	Brunswick	1802	30	95	0	34	0	34	0	0	0	..	..	0	0	2	6	1	
MARYLAND.																			
[1]U. S. Naval Acad.,	Annapolis	....	..	..	..	..	..	..	..	..	..	60	60	..	..	..	..	..	6
Johns Hopk's Univ.	Baltimore	1876	..	..	..	..	..	..	..	..	..	35	121	10	23	3	7[2]	1	7
Md. Agric. Coll.,	College Park	1858	..	30	..	3	..	9	..	.	5	..	..	0	6	1	5	1	2
Western Md. Coll.,	Westminster	1867	..	44	..	0	..	8	0	..	0	..	..	..	0	..	2	..	1
New Windsor Coll.	[3]New Windsor	1843	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mt. St. Mary's Coll.	Emmitsburg	1815	..	..	..	..	..	..	.	..	..	18	27	..	..	1	1	..	1
MASSACHUSETTS.																			
Wellesley College,	Wellesley	1875	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tufts College,	Boston	1855	1-2	65	0	14	1-2	36	15	0	0	..	..	..	15	2	17	1	5
Harvard Univ.,	Cambridge	1636	61	410	9	104	69	195	73	0	0	..	..	139	782[4]	4	16	6	22
[5]Clark University,	Worcester	1889	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mt. Holyoke Coll.,	South Hadley	1837	31	162	0	28	0	113	11	0	0	..	..	0	8	1	10	1	5
Radcliffe College,	Cambridge	1879	..	10	..	4	..	10	2	..	0	..	..	..	4	..	8	..	4
Mass. Inst. of Tech.,	Boston	1861	44	385	3	35	27	145	30	0	0	..	..	29	80	11	25	7	26
Worcester Pol. In.,	Worcester	1868	20	90	0	9	4	35	7	0	0	..	..	5	37	4	16	1	5
MICHIGAN.																			
Adrian College,	Adrian	1859	10	16	0	5	0	2	0	0	0	..	..	..	0	1	3	1	1
Mich. Coll. of Mines	[6]Houghton	1887	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Agricultural Coll.,	Agric. College	1857	42	72	15	45	15	?	0	17	37	..	..	1	10	1	3	2	3
[7]Kalamazoo Coll.,	Kalamazoo	1855	..	38	..	..	..	31	..	..	..	[8]	38	..	..	..	..	..	2

[1] Whole of third class, no specialization. [2] Most of these courses accompanied by laboratory work. [3] Nothing given. [4] Have at least one elective in chemistry—Research men, 17. [5] Department discontinued. [6] "This institution only graduates mining engineers." [7] No student laboratory in 1876 [8] No records.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
MICHIGAN--*Con.*																			
Alma College,	Alma	1887	..	19	..	0	..	26	0	..	0	..	45	..	10	..	4	..	2
Hillsdale College,	Hillsdale	1855	..	25	..	..	..	25	..	..	..	..	..	..	0	..	2	..	2
Univ. of Michigan,	Ann Arbor	1837	300[1]	800	200[1]	460	225[1]	600	40	..	0	[1]	..	..	50	9	40	6	12[2]
MINNESOTA.																			
Carleton College,	Northfield	1870	..	76	..	9	..	25	0	..	0	..	..	..	0	..	4	1	2
Gustavus Adolphus College,	St. Peter	1886	..	10	..	..	..	..	..	..	..	..	..	..	0	..	1	..	1
Univ. of Minnesota	Minneapolis	1868	24	620	..	16	3	80	0	3	..	..	..	3	50	3	27	1	9
Hamline Univ.,	St. Paul	1880	..	25	..	2	..	20	0	..	0	..	..	..	6	..	4	..	2
Augsburg Semi'y,	Minneapolis[3]	1869	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
MISSISSIPPI.																			
University,	Oxford	1848	9	96	9	33	5	14	0	..	0	..	..	0	4	2	6	1	2
Alcorn A.& M.Col.,	Westside[4]	1871	..	44	..	6	..	6	6	..	6	..	..	0	0	..	1	..	1
Agric. and Mechanical Coll.,	Starksville[5]	1880	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Millsaps College,	Jackson	1892	..	40	..	5	..	6	3	..	..	..	..	..	4	..	4	..	2
MISSOURI.																			
Central College,	Fayette	1855	..	28	..	..	..	4	..	..	..	..	..	..	..	..	[6]	..	1
Mo. Wesl'an Univ.,	Cameron[7]	1887	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Odessa College,	Odessa[8]	1882	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
University of State,	Columbia	1841	14	183	0	35	36	55	3	..	41	..	..	..	..	9	14	2	5
Washington Univ.,	St. Louis	1859	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

[1] Including departments of medicine, pharmacy and dentistry. [2] Besides assistants. Note—physiological chemistry not included. [3] No course in chemistry. [4] One course given apparently includes all. [5] "There is no course in chemistry in this college. We have an agricultural, a mechanical and a textile course, and chemistry is taught in all three courses." [6] "Regular collegiate work." [7] No answer. [8] No classes in chemistry.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
MONTANA.																			
Agric. & Mech. Coll.	Bozeman	1893	..	23	..	0	..	40	4	..	2	..	..	..	6	..	2	..	6(?)
NEBRASKA.																			
Union College,	College View	1887	..	12	..	8	..	16	..	..	..	..	28	..	9	..	3	..	2
Grand Island Coll.,	Grand Island	1892	..	5	..	..	..	2	..	..	..	..	..	..	1	..	4	..	1
Neb. Wesleyan Coll.	University Place	1888	..	72	..	2	..	8	2	..	0	..	..	..	4	..	6	..	1
Creighton Univ.,	Omaha	1879	..	57	..	32	..	24	24	..	..	..	..	..	0	..	4	..	3
Univ. of Nebraska,	Lincoln	1869	21	268	0	34	5	135	5	0	26	..	..	0	10	..	32	1	16
Bellevue Coll. or Univ. of Omaha	Bellevue	1883	..	14	..	..	..	..	..	..	..	..	..	0	0	..	2	..	1
NEW HAMPSHIRE.																			
Dartmouth,	Hanover	1769	..	110	..	20	..	70	0	..	0	..	..	..	7	3	7	1	2
Agric. & Mech. Coll.	Durham	1866	14	24	0	12	7	17	2	0	18	..	..	0	7	3	12	1	3
NEW JERSEY.																			
[1]Rutgers College,	New Brunswick	1766	..	..	..	..	..	..	..	..	..	..	..	5	10	10	40	3	2
Princeton Univ.,	Princeton	1746	125	350	0	6	45	117	?	0	0	..	..	5	25	2	15	3	8
Stevens Inst. of Technology,	Hoboken	1870	30	180	..	..	25	120	..	..	.	..	..	..	[2]	2	2	1	3
NEW MEXICO.																			
University,	Albuquerque	1892	..	5	..	0	..	2	..	..	..	..	..	..	0	..	4	..	1
School of Mines,	Socorro	1889	..	14	..	0	..	4	0	..	0	..	..	..	0	..	4	..	1
NEW YORK.																			
[3]U.S. Milit'y Acad.,	West Point	1812	58	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Stephen's Coll.,	Annandale	1860	..	14	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1

[1] "Growth, however, has been satisfactory." [2] No special students admitted. [3] One instructor to nine students—laboratory practice required in 1890 for first time.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
NEW YORK—*Con.*																			
Columbia Univ.,	New York	1754	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Barnard College,	New York	1889	..	14	..	3	..	3	2	..	0	..	..	..	1	..	4	..	2
St. Mary's Coll.,	[1]Marion County	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
College of City of New York,	New York	1847	104	398	0	77	0	23	55[2]	224	..	..	..	0	0	3	3	2	4
Colgate University,	Hamilton	1819	..	..	..	..	..	..	..	..	..	..	..	..	..	.	6	..	2
Cornell University,	Ithaca	1868	..	417	..	157	..	679	23	..	82	[3]	..	..	..	11	51	6	20
Rensselaer Polytechnic Inst.,	Troy	1824	..	..	..	..	..	..	..	..	..	200	200[4]	..	..	..	..	..	3
Hobart College,	Geneva	1822	..	30	..	7	..	30	..	..	..	..	..	..	0	..	6	..	1
NO. CAROLINA.																			
A. & M. College,	Raleigh	1889	..	70	..	17	..	20	0	..	4	..	..	..	8	..	12	..	4
Wake Forest Coll.,	Wake Forest	1834	..	85	..	9	..	10	0	..	0	7	104	0	2	1	4	1	2
Davidson College,	Davidson	1837	25	54	0	14	10	32	..	..	..	..	..	0	0	2	4	1	3
Trinity College,	Durham	1859	..	25	..	0	..	10	0	..	3	20	38	0	4	1	6	1	3
Catawba College,	Newton	1851	..	30	..	30	..	0	0	..	0	..	..	..	0	..	1	..	1
Guilford College,	Guilford	1888	..	20	..	0	..	7	0	..	0	..	..	..	2	..	3	..	1
Weaverville Coll.,	Weaverville[5]	1873	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Univ. of N. C.,	Chapel Hill	1795	0[6]	137	0	8	0	84	5	0	16	[6]	..	0	11	1	14	1	6
Livingstone Coll.,	Salisbury	1882	..	12	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Baptist Female University,	Raleigh	1899	..	..	..	..	..	..	..	..	..	..	29	..	0	..	3	..	1
N. DAKOTA.																			
State University,	Grand Forks	1884	..	45	..	0	..	15	0	..	..	..	..	..	0	..	2	..	1

[1] No data. [2] Not understood. [3] No records. [4] Limited to 200 students; fixed curriculum and no electives. [5] Elementary. [6] Reopened fall 1876.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
N. DAKOTA—*Con.*																			
Red River Valley University,	Wohpeton[1]	1892	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fargo College,	Fargo	1887	..	6	..	0	..	2	0	..	..	0	..	..	0	..	2	..	1
Agric.&Mech.Coll.	Agric. College,	1891	..	15	..	0	..	7	0	..	..	4	..	..	0	..	5	..	1
OHIO.																			
Case School of Applied Science,	Cleveland	1877	..	150	..	15	..	60	15	..	0	..	..	..	40	..	1[2]	..	6
Miami University,	Oxford	1824	25[3]	34	..	4	..	11	0	..	0	..	..	..	2	1[3]	5	1[3]	1
Ohio State Univ.,	Columbus	1870	12	325	0	25	6	50	25	0	132	..	..	1	30	3	30	1	15
Willamette Univ.,	Tippecanoe City	1835	..	11	..	0	..	0	0	..	0	[4]	11	..	3	..	2	..	2
Hiram College,	Hiram	1867	..	38	..	..	..	..	..	..	..	..	..	0	0	1	1	1	1
Baldwin Univ.,	Berea	1845	5	15	0	0	0	3	0	0	0	..	..	0	0	..	2	..	2
Univ. of Wooster,	Wooster	1870	..	55	..	26	..	0	0	..	0	..	..	..	0	..	3	..	1
Buchtel College,	Akron	1872	27	18	..	2	12	26	0	..	0	..	..	2	6	2	4	1	2
Heidelberg Univ.,	Tiffin	1850	15	36	0	0	0	36	0	..	0	..	..	0	1	1	2	1	3
Ohio University,	Athens	1804	14	32	0	0	0	16	0	0	0	..	..	0	5	1	8	?	2
Scio College,	Scio	1866	..	48	..	7	.	2	0	..	0	..	..	.	2	..	2	.	3
Kenyon College,	Gambier	1825	..	38	..	8	..	8	0	..	0	30	54	0	0	1	7	1	4
Wilmington Coll.,	Wilmington	1875	..	23	..	3	..	10	0	..	0	..	..	..	0	..	1	..	1
Oberlin College,	Oberlin	1833	..	75	..	7	..	31	..	..	..	62	113	0	2	1	6	1	2
Univ.of Cincinnati,	Cincinnati	1874	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
OKLAHOMA.																			
Univ. of Oklahoma,	Norman	1892	..	30	..	12	..	36	0	..	0	..	78	..	0	..	8	..	2
Agric.&Mech.Coll.	Stillwater	1891	..	52	..	14	..	3	0	..	0	..	..	..	17	..	1[5]	..	2

[1] No data. [2] Evidently by curriculum. [3] Closed 1872-'85. Figures for 1872. [4] Fire that year. [5] Technical institution; hence, must mean full college course.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
OREGON.																			
Philomath Coll.,	Philomath	1867	..	3	..	3	..	0	0	..	0	..	..	..	..	0	1	..	1
Univ. of Oregon,	Eugene	1876	..	42	..	4	..	21	0	..	0	..	..	0	6	0	8	0	3
PENNSYLVANIA.																			
Penna. State Coll.,	State College	1859	20(?)	200	0	30	20(?)	200	0	..	7	..	..	0	35	0	1[1]	2	8
Susquehanna Univ,	Selinsgrove	1894	..	16	..	7	..	7	0	..	0	..	..	..	..	..	5	..	1
Central H. School,	Philadelphia	1838	..	531	..	95	..	23	0	..	0	..	..	0	23	..	..	2	4
Bucknell Univ.,	Lewisburg	1845	17	80	0	13	0	33	0	0	6	..	..	0	12	1	15	1	3
Lincoln Univ.,	Chester County	1854	..	..	..	..	..	..	..	..	..	..	40(?)	..	..	.	..	..	..
F. & M. Univ.,	Lancaster	1853[2]	20	50	0	2	0	10	0	..	0	..	..	0	4	..	2	1	2
Lafayette College,	Easton	1840	..	..	..	..	..	..	..	..	..	90	150	10	30	1	2[3]	3	5
Univ. of Penna.,	Philadelphia	1740	..	..	..	..	..	..	..	..	..	120	375[4]	10	110	..	..	..	..
Bryn Mawr Coll.,	Bryn Mawr	1885	..	..	..	..	..	..	..	..	..	..	65	.	10	..	6	..	3
Juniata College,	Huntington	1876	..	6	..	0	..	0	0	..	0	..	..	0	0	..	1	..	1
Allegheny Coll.,	Meadville	1821	25	62	..	..	0	16	..	..	..	..	..	0	7	1	3	1	2
Central Pa. Coll.,	New Berlin[5]	1855	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	1
Pennsylvania Col.,	Gettysburg	1832	20	50	0	12	2	34	0	..	0	..	..	1	4	1	8	1	2
West. Univ. of Pa.,	Allegheny	1817	..	75	..	6	..	60	..	..	..	..	..	..	15	..	1	..	2
RHODE ISLAND.																			
Brown University,	Providence	1764	..	99	..	77	..	23	0	..	0	..	..	0	0	5	17	2	4
SOUTH CAROLINA.																			
Claflin University,	Orangeburg	1869	..	26	..	.	..	..	..	..	..	..	..	..	..	..	2	..	1
Newberry Coll.,	Newberry	1856	..	22	..	..	..	4	..	..	..	..	..	..	4	..	..	..	1
Clemson Agri. Col.	Clemson	1893	..	129	..	18	..	47	0	..	9	..	..	..	..	..	..	..	4
S.C. Military Acad.	Charleston	1842	..	27	..	42	..	42	0	..	0	..	..	..	0	..	3	..	1

[1] "B. S. in chemistry" general chemistry, organic, industrial, sanitary, qualitative and quantitative analysis, etc. [2] Franklin 1789; Marshall 1836; united 1853. [3] Chemical course, see Pa. State College. [4] Medical and other "professional students" not included. [5] No data.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
SOUTH CAROLINA—*Con.*																			
Coll. of Charleston,	Charleston	1785	..	14	..	5	..	0	0	..	0	..	..	0	2	..	..	1	1
Furman Univ.,	Greenville	1852	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SOUTH DAKOTA.																			
Yankton College,	Yankton	1882	..	15	..	2	..	10	0	..	0	..	..	0	1	..	3	1	1
S. D. Sch. of Mines,	Rapid City	1885	..	24	..	..	..	21	..	..	..	..	..	..	..	..	4	..	2
TENNESSEE.																			
Univ. of Tennessee,	Knoxville	1794	..	103	..	..	..	98	0	..	0	..	..	..	..	..	..	..	3
Peabody Nor. Col.[1]	Nashville	1876	..	206	..	32	..	14	0	..	0	..	..	..	4	..	8	..	2
Bethel College,	McKenzie	1851	..	5	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1
[2]Vanderbilt Univ.,	Nashville	1873	..	90	..	32	..	125	0	..	0	46	..	.	..	3	21	2	7
S. W. Pres. Univ.,	Clarksville	1875	..	29	..	29	..	29	0	..	0	..	..	..	0	..	3	..	1
Amer. Tem. Univ. of Harriman,	Harriman	1891	..	8	..	0	..	4	0	..	0	..	..	..	0	..	2	..	1
Burritt College,	Spencer	1848	4	16	..	0	..	0	0	..	0	..	..	..	0	..	1	..	1
[3]Fisk University,	Nashville	1866	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..
[4]Cumberland Univ.	Lebanon	1842	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Grant University,	Athens	1866	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carson & Newman College,	Mossy Creek	1845	..	3	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1
[5]Walden Univ.,	Nashville	1867	..	50	..	0	.	10	0	..	0	..	..	..	0	..	1	..	1
(Sewanee) Univ. of the South,	Sewanee	1857	..	78	..	69	..	4	..	..	..	..	..	..	0	..	3	..	2
TEXAS.																			
Agric. & Mech. Col.	College Station	1876	..	92	..	18	..	44	0	..	6	..	..	..	1	..	3	..	2

[1] Collegiate department of University of Nashville; professional students not included. [2] Medical not included. [3] Thirteen weeks elementary.
[4] No data. [5] Does not include Meharry Medical School—75 general chemistry, 60 qualitative analysis and urinalysis.

TABLE I—(*Continued*).

Institution.	Location.	Year founded or first opening.	Students in inorganic chemistry.		Organic chemistry.		Analytical chemistry.		Physical chemistry.	Agricultural chemistry.		Total students in chemistry.		Special students in chemistry.		Number courses offered in chemistry.		Teaching force.	
			1876	1901	1876	1901	1876	1901	1901	1876	1901	1876	1901	1876	1901	1876	1901	1876	1901
TEXAS—*Con.*																			
Univ. of Texas,	Austin	1839[1]	..	81	..	11	..	20	5	..	0	..	..	..	12	..	12	..	6
Christian Univ.,	Waco	1873	..	7	..	..	..	..	..	..	..	..	..	..	..	..	3	..	1
Fort Worth Univ.,	Fort Worth	1881	..	20	..	..	..	4	..	..	..	..	..	..	1	..	..	..	..
Austin College,	Sherman	1850	..	23	..	..	..	6	..	..	..	..	..	..	..	..	3	..	1
VIRGINIA.																			
Wash. & Lee Univ.,	Lexington	1749	..	48	..	2	..	10	0	..	0	47	..	0	1	1[2]	9	1	2
Richmond College,	Richmond	1832	20	25	..	..	..	7	0	..	0	1	..	..	0	1	3	1	1
Univ. of Virginia,	Charlottesville	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hamp.-Sidney Col.	Hamp.-Sidney	1776	..	35	.	4	..	5	0	..	0	..	..	0	0	1	3	1	1
WASHINGTON.																			
Agricultural Coll.,	Pullman	1890	..	60	..	18	..	22	0	..	4	..	..	..	7	..	12	..	3
Whitman College,	Walla Walla	1883	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Whitworth Coll.,	Tacoma	1890	..	2	..	..	..	..	..	..	..	..	..	..	0	..	2	..	1
WEST VIRGINIA.																			
Univ. of W. Va.,	Morgantown	1867	15	48	0	15	0	30	5	0	5	..	..	0	15	0	15	..	3
WISCONSIN.																			
Univ. of Wisconsin,	Madison	1849	..	320	..	10	..	30[3]	24	..	7	70[4]	.	..	50	..	21	1	9[5]
[6]Mission House,	Franklin	1860	0	4	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Lawrence Univ.,	Appleton	1847	25	65	0	0	0	70	..	..	..	..	..	0	0	1	4	1	2
Milton College,	Milton	1867	..	9	..	..	..	5	8	..	0	..	..	..	1	..	3	..	1
WYOMING.																			
Univ. of Wyoming,	Laramie	1888	..	25	..	3	..	0	0	..	2	..	..	..	3	..	[7]	..	1

[1] Opened 1883. [2] This one course included lectures on the various convenient divisions of chemistry. [3] Quantitative analysis. [4] General chemistry. [5] Two professors in each—agricultural and pharmaceutical chemistry not included. [6] General course in theological seminary. [7] Thirteen terms, three terms a year.

ORGANIC CHEMISTRY.

Probably no topic is better suited than organic chemistry to indicate the advance which has been made in America during the last quarter century in teaching and in active work for the growth of our science. Twenty-five years ago the science of organic chemistry was already well developed, and there were many active workers in Germany, France, and England, but at that time there were in America, at most, only five or six colleges and universities in which researches in this field were conducted, and in only three of these were students engaged in research work. In the table given below there will be found more than thirty institutions where students are now engaged in such researches, and the total number of such students is more than one hundred. The number of students receiving instruction in the subject is also very greatly increased, and the majority of these students do laboratory work.

A request for statistics for 1876 and for 1901 on the following points, was sent to fifty-nine colleges, universities, and technical schools:

(1) Number of professors and instructors teaching organic chemistry.

(2) Number of students taking lecture work in organic chemistry.

(3) Number of students taking laboratory work in organic chemistry.

(4) Number of professors and instructors doing research work in organic chemistry.

(5) Number of students doing research work in organic chemistry.

The replies are tabulated below, the numbers at the head of each column referring to the numbered questions as just given.

In studying this table it must be remembered that mere numbers cannot represent accurately the work done in different institutions and also that it was impossible, in some cases, to know whether the replies were given on a uniform basis.

Thus the University of Michigan reports 321 medical, dental, and pharmaceutical students which are not included in the table. Similar students may have been included in some other cases

where the report was less definite. The University of Minnesota reports 280 students taking a twelve weeks' course in the subject and not included. Very likely similar short courses are included elsewhere. The numbers for Purdue University do not include courses giving instruction in regard to foods, oils, and similar topics.

If not scrutinized too closely for accurate details, the tables will be found to give a fairly satisfactory comparison of the instruction given in America in pure organic chemistry in 1876, and at the present time. The table is not, of course, complete, and there are many other institutions where instruction in organic chemistry is given.

During the past twenty-five years a large amount of valuable work in organic chemistry has been done in America—more, perhaps, than most American chemists realize, and certainly more than we receive credit for abroad. Some of this work has been published in Europe, especially in German journals, but a large proportion of it has appeared in the *American Chemical Journal* under the editorship of Professor Remsen. This journal which is almost coextensive in its life with our own Society, while it is general in its scope, has been especially useful in promoting the development of organic chemistry.

TABLE II.

1876.	(1)	(2)	(3)	(4)	(5)
Amherst College	1	25	..	..	..
Case School of Applied Science	..	..	..	..	..
University of Georgia	1	37	..	..	..
Harvard University	..	..	..	..	..
University of Illinois	1	35	..	..	..
Iowa College	1	10	..	..	..
Kansas Agricultural College	1	2	..	..	..
Kansas University	1	2	..	..	..
Lafayette College	1	50	..	..	..
Massachusetts Institute of Technology	2	6	5	2	5
University of Michigan	1	5	0	1	0
University of Mississippi	1	6	..	..	..
University of Pennsylvania	1	2	2	..	..
University of Virginia	2	101	4	1	2
Western Reserve University	1	2	..	..	..
Yale University (Sheffield Sci. School)	2	12	0	1	0
1901.					
University of Alabama	2	25	3	..	..

	(1)	(2)	(3)	(4)	(5)
Amherst College	1	20	20	..	..
Beloit College	1	14	14	1	..
Brown University	3	80	80	1	2
Bryn Mawr College	2	50	19	1	4
Case School of Applied Science	3	16	8	3	3
University of Chicago	3	40	30	2	15
University of Cincinnati	..	..	..	..	..
Columbia University	2	30	19	4	8
Columbian University	2	70	9	1	1
Cornell University	2	58	20	2	4
Dartmouth College	2	18	18	2	..
University of Georgia	1	6	6	..	..
Harvard University	..	..	..	..	..
University of Illinois	3	69	69	2	2
University of Indiana	3	24	20	3	2
Iowa College	1	5	5	..	..
Iowa State College	1	40	40	..	..
Iowa University	1	12	14	..	..
Johns Hopkins University	2	49	44	2	8
Kansas Agricultural College	1	110	..	..	..
Kansas University	2	43	43	1	2
Lafayette College	2	90	90	2	3
Lewis Institute	2	6	6	1	1
Massachusetts Institute of Technology	3	70	36	6	9
Michigan Agricultural College	..	..	.	..	..
University of Michigan	3	57	30	6	9
University of Minnesota	1	10	16	4	5
University of Mississippi	2	31	31	1	3
University of Missouri	1	35	35	..	..
University of Nebraska	2	32	32	1	1
New Hampshire Agricultural College	1	13	1	1	..
University of North Carolina	1	7	7	1	2
Northwestern University	2	15	15	..	..
Oberlin College	1	3	3	1	..
University of Ohio	1	25	25	2	2
University of Pennsylvania	2	30	35	1	3
Purdue University	1	9	9	2	2
Princeton University	2	6	6	1	..
Rensselaer Polytechnic Institute	..	..	..	..	..
University of Rochester	1	0	3	..	..
Rose Polytechnic Institute	2	9	4	2	2
Smith College	2	16	16	..	..
Stanford University	1	23	18	1	3
University of Texas	1	0	11	2	3
Tufts College	2	14	7	3	2
Vanderbilt University	1	8	2	..	..

	(1)	(2)	(3)	(4)	(5)
Vassar College	2	10	10	..	..
University of Virginia	2	162	6	2	4
Washington University (St. Louis)	2	8	9	2	2
Washington and Lee University	1	2	2	..	..
Western University (Allegheny, Pa.)	2	4	4	2	..
Western Reserve University	2	20	20	1	..
University of Wisconsin	3	60	60	3	8
Worcester Polytechnic Institute	2	9	9	1	3
Yale University	8	88	90	7	3

W. A. N.

PHYSICAL CHEMISTRY.

When the American Chemical Society was founded, the subject of chemistry had not yet become sufficiently differentiated to give any special prominence to what is now termed physical chemistry. Indeed, it might be said that the subject as such did not exist at that time. This statement must not be interpreted, however, as meaning that physical chemistry has sprung up suddenly and has developed from the subjects of chemistry and physics in an unnatural or artificial manner. On the contrary, the very opposite is the fact. The beginnings of physical chemistry date back to the very beginnings of chemistry. The founders of modern chemistry, the men that were so prominent during the latter part of the 18th and the former part of the 19th century, to a very large extent employed physical means to investigate chemical problems. Before the subjects of physics and chemistry had become separated from each other, all chemists and physicists were physical chemists. During the development of analytical and organic chemistry, which forms such brilliant pages in the history of the progress of science, attention was primarily directed to the end-products of chemical reactions. These products were studied as to their qualitative and quantitative composition and their various properties. The results of these fruitful investigations now fill by far the major part of our chemical dictionaries and handbooks. The importance of the discovery of new substances and of studying their properties and the means for their qualitative detection and quantitative estimation can hardly be overestimated as to its immediate bearing upon human welfare; and it is but natural that the development

of chemistry should early have taken this direction. During this period of special study of end-products, nearly all of the physical means known to-day have been used more or less extensively. The balance, the pycnometer, the thermometer, the retort, the crystallizing dish, the test-tube, the casserole, the filter, the graduated flask and burette, the various hot and cold baths, the means of operating under increased or diminished pressure have figured with particular prominence, and are to the present day considered as the apparatus characteristic of the chemical laboratory. To be sure the calorimeter, the spectroscope, the polariscope, and even the galvanometer, the refractometer and photometer have at times been called into requisition but only to further the general aim.

During the time that chemists were chiefly occupied in studying the products of chemical reactions, physicists were developing refined methods of exact measurement; and the two sciences, originally practically one, became more and more distinct. This differentiation was hastened by the fact that chemical work required only a knowledge of arithmetic, while that of the sister science called for training in higher mathematics. And yet during this entire period there always were some men whose researches lay on the border line between the two sciences. It is the work of these men that has kept alive the intimate connection between chemistry and physics, and that forms the foundations of modern physical chemistry. Investigators on this border line between the two sciences have of late years become sufficiently active and numerous to draw special attention to their work. Indeed because of their efforts chemistry has gradually passed out of the period characterized by the prominence of the study of end-products of chemical action to that in which the processes of the formation of these products, together with all the concomitant energy changes that take place, are considered subjects worthy of special inquiry. It is clear that for such work a knowledge of inorganic, organic and analytical chemistry, and of physics and mathematics is indispensable. Physical chemists have sought to equip themselves with this necessary preparation, and thus they have by their equipment and the consequent nature of their work become differentiated from physicists on the one hand and chemists on the other. The aim of physical chemistry

is a very broad one. As above stated, it is to study the processes of chemical change, together with all the energy changes that accompany them. It thus touches all fields of chemistry. In studying the progress of chemical reactions and the conditions of chemical equilibrium the rich funds of analytical, inorganic, and organic chemistry have to be drawn upon ; in investigating the energy changes the methods of physical measurement, so well developed by the sister science, have to be called into requisition. Because of the large draft upon methods heretofore employed chiefly by physicists, the new field of research, if new it may be called, received its name,—physical chemistry. It is in fact general chemistry,—chemistry of the most general kind. The importance of the study of chemical processes must be patent to all. If once the processes are better understood, the quality and particularly the quantity of the end-products can better be regulated, and new processes will undoubtedly be more readily discovered. Thus physical chemistry is destined to give a new lease of life to organic, inorganic, and analytical chemistry, and in turn these will not fail to react favorably upon the former.

In the biological sciences a similar tendency is apparent. From a study of anatomy and morphology attention is more and more directed toward the study of the life processes. Physiology is coming into greater prominence. Plant and animal physiologists apply to physicists and chemists for help and information. They get but little that they can use. Refined methods of physical measurement do not aid them, and the chemical analyses of the products of vital activity do not help them much in their attempts to gain an insight into the processes that formed such products. While physical chemistry is doing and will continue to do much for chemistry as such, its greatest hope is perhaps that it may open up the avenue to a better understanding of the life processes, if not to unravel completely the mysteries that still so closely envelop vital phenomena. What this would mean for medicine—which touches the welfare of humanity as perhaps no other branch of learning does—what this would mean for agriculture in its various branches, and the arts in turn depending upon them and ministering to the wants of mankind, can at present only be imagined.

And now what are the facilities for the study of physical chem-

istry in America at the twenty-fifth anniversary of the American Chemical Society? Courses in the subject are offered in nearly all of the important higher institutions of learning; but until 1901 only two American universities, Cornell and Wisconsin, have deemed the subject important enough to establish professorships for the exclusive pursuit of physical chemistry. Columbia University has recently fallen into line by appointing an adjunct professor of physical chemistry, whose time will be devoted wholly to that subject. (These statements are based largely upon information gathered from the latest catalogues of American colleges and universities.)

Possibly the manner in which physical chemistry has developed in recent years is to a certain extent responsible for the present attitude toward it in our country. When the words physical chemistry are mentioned, they but too frequently call to mind simply molecular-weight determinations, theories of very dilute solutions, of electrolytic dissociation and the like; and to be sure these seem to be and possibly—or even probably—they are only remotely related to human welfare. This may in part account for the fact that the subject has in so few cases been considered sufficiently important to occupy a professor's exclusive attention. But much excellent research in physical chemistry has in recent years been done in America in spite of this condition of affairs. Let this good work continue and the results will soon be followed by a proper recognition of the subject in all our larger universities at least. What will hasten this more than anything else is that physical chemists bear constantly in mind the general aim of their work, which like that of all sciences is to minister to the welfare of mankind in the broadest and highest sense of the word. Science must have all avenues for its progress open; but it must be borne in mind that science is for man and not man for science. At some day in the distant future when life on this mundane sphere shall have become extinct, science will have but little value indeed.

It is to be hoped that physical chemistry may fully realize its high aspirations to promote the welfare of mankind and that it will soon demonstrate its rights to a full recognition in all our higher institutions of learning. A promising indication of the accomplishment of that end is had in the success of the *Journal of Physical Chemistry* now in its fifth volume.

For number of students in physical chemistry see Table I.

L. K.

AGRICULTURAL CHEMISTRY.

When a review of the progress of agricultural chemistry is under consideration, we are reminded of the establishment of many of the agricultural colleges a few years preceding the founding of our Society. Not long after (1882), the Association of Official Agricultural Chemists, which has done and is doing so much for securing standard and satisfactory analytical methods, was organized (see yearly Bulletin, H. W. Wiley, editor). The experiment stations established in 1887 (see report of the director, A. C. True), whose work can only be accomplished by means of the chemical interpreters, then the present soil surveys, and finally the establishment of a division of chemistry in the Department of Agriculture, are marks of progress. It is to be noted, however, from the original reports received from what are known as the "land-grant colleges," that the number of students in agricultural chemistry (see Table I) is small.

In order to secure more definite information, Dr. Charles L. Parsons, of the New Hampshire Agricultural and Mechanical College, kindly consented to secure statistics and report on the same. The report follows:

"As requested I have endeavored to ascertain the extent to which chemistry is taught in the "land-grant colleges" of the United States and especially to determine whether or not the students of the agricultural course do or do not receive instruction in chemistry with special reference to its application to agriculture and agricultural products. With this end in view I sent a letter to the professor in charge of the chemical department at each of the "land-grant colleges," requesting a reply to each of the following questions and enclosing a stamped and addressed envelope.

"(1) What proportion of the students in all courses in your college receive instruction in chemistry?

"(2) What proportion of the students in your agricultural course receive chemical instruction with special reference to agricultural products, plant-life, fertilizers, etc., *i. e.*, agricultural chemistry?

"(3) What proportion in other courses?

"(4) To how many students was instruction in agricultural chemistry given this last college year?"

TABLE III.[1]

	(1)	(2)	(3)	(4)
Alabama Polytechnic Institute, Auburn, Ala	48 per cent.	all	none	30
University of Arizona, Tucson, Arizona	one-half	none	....	none
Arkansas Industrial University, Fayetteville, Arkansas	....	....	....	....
University of California, A. and M. College, Berkeley, Cal	all	all	elective	27
State Agricultural College, Fort Collins, Colorado	all	all	none	3
Storrs Agricultural College, Storrs, Connecticut	....	....	....	....
Delaware College, Newark, Delaware	....	....	....	....
A. and M. College, Lake City, Florida	all	all	....	2
University of Georgia, Athens, Georgia	....	....	....	....
University of Idaho, Moscow, Idaho	50 per cent.	two-thirds	none	2
University of Illinois, Urbana, Illinois	....	....	....	....
Purdue University, Lafayette, Indiana	all except short course of 11 weeks	all except short course of 11 weeks	none	29
Iowa State College, Ames, Iowa	all	all	....	90
State Agricultural College, Manhattan, Kansas	all	all	....	14
State College, Lexington, Kentucky	all	all	none	4
State University, Baton Rouge, Louisiana	90 per cent.	all	30 per cent.	110
Southern University, A. and M. College, New Orleans, La	about two-thirds	about one-fourth	about one-third	18
University of Maine, Orono, Maine	all	all	....	29
Agricultural College, College Park, Maryland	all	all	many	60
University of Missouri Agricultural College, Columbia, Missouri	all	all	none	5
Michigan Agricultural College, Agricultural College, Michigan	all	all	....	37
Univ. of Minn., Coll. of Agr., St. Anthony Park, St. Paul, Minn.	all	all	...	300
Mississippi Agricultural College, A. and M. College, Miss	all	all	none	82
Alcorn A. and M. College, West Side, Mississippi	12 per cent.	12 per cent.	none	6
State Agricultural College, Amherst, Massachusetts	all	all	all	69

[1] Figures for the year 1900 and 1901.

TABLE III—(*Continued*).

	(1)	(2)	(3)	(4)
Montana State College, Bozeman, Montana	all	all	....	2
University of Nebraska, Lincoln, Nebraska	33 per cent.	all	....	30
Nevada State University, Reno, Nevada	....	....	...	....
Rutgers College, New Brunswick, New Jersey	all	two-thirds	....	48
New Hampshire College, Durham, N. H	all	all	....	27
A. and M. College, Mesilla Park, New Mexico	all except those in prep. and stenographic courses	all except those in prep. and stenographic courses	....	1
Cornell University, Ithaca, New York	40 per cent.	all	few	115
N. C. College of A. and M. A., Raleigh, N. C	all	all	none	6
Agricultural College, Fargo, North Dakota	all	all	chem. course	5
Ohio State University, College of Agriculture, Columbus, Ohio	all	all	....	132
Oklahoma A. and M. College, Stillwater, Oklahoma	all	....	chem. course	30
Oregon State Agricultural College, Corvallis, Oregon	....	....	....	....
Pennsylvania State College, State College, Penna	all	all	none	50
Rhode Island A. and M. College, Kingston, R. I	all	all	....	none
Clemson College, Clemson College, South Carolina	all	all	none	9
Agricultural College, Brookings, South Dakota	all	all	40 per cent.	18
University of Tennessee, Knoxville, Tennessee	about 45 per cent.	all	none	29
A. and M. College, College Station, Texas	all	all	none	8
Agricultural College, Logan, Utah	all	all	elective	4
University of Vermont, Burlington, Vermont	....	....	....	....
Virginia Polytechnic Institute, Blacksburg, Virginia	all	all	part	10
Washington College of Agriculture and School of Science, Pullman, Washington	42 per cent. collegiate	all	none	2
West Virginia University, Morgantown, West Virginia	about 60 per cent.	all	5–10 per cent.	20
University of Wisconsin, Madison, Wisconsin	one-fourth	all	elective	119
University of Wyoming, Laramie, Wyoming	all	all	none	none
Total college year 1900-'01				1,582

To the fifty inquiries, forty-two replies have been received. They are fairly representative. It will be noted that almost without exception, every student in all courses is required to take up the subject of chemistry at some time during his course and many letters received indicate that a good proportion of these colleges have fairly full and complete courses of chemical study. In fact it is well known that in a few instances their chemical course is the equal of any given in this country. The few exceptions that do occur are generally those of students in preparatory or short, one- or two-term, courses. With scarcely an exception, every student of agriculture is required to take special work in agricultural chemistry and even in the so-called agricultural "short courses" chemical lectures on dairy products, fertilizers, animal and plant foods, etc., are almost invariably given.

"Comparatively few replies were received to the third question, but it is evident from these that special instruction in agricultural chemistry is, in general, limited to agricultural students, although several state that students in any course, taking advanced chemical instruction, especially in quantitative analysis, have much information in regard to the composition and analysis of agricultural products imparted to them. These have not been included in the summary under (4) except where they were agricultural students or took special work.

"The total number of students taking agricultural chemistry in the forty-two colleges replying is 1582. Most of these same students also take general and analytical chemistry, and in many instances other advanced work. Considering the total number of students in these colleges the number may seem small but it includes almost all of those in the agricultural courses for the year in which agricultual chemistry is taught."

INDUSTRIAL OR TECHNICAL CHEMISTRY.

In considering this phase of the subject, we must make two divisions which we may term, first, the amateur, and second, the professional. In regard to the former, a quotation from

Priestley's essay on education is pertinent. "It seems to me a defect in our present system of public education that a proper course of studies is not provided for gentlemen who are designed to fill the principal stations of active life, distinct from those who are adapted to the learned professions." By this is taken a course of lectures on industrial chemistry, really economics, chemically considered, offered in many institutions. By means of such amateurs, the subject which is neither fully appreciated nor understood in some sections of our country becomes more popularized and its usefulness extended. After a comparative study of tables made from the government reports (which see) illustrating the increase in exports of manufactured goods, a graduate, so-called classical or otherwise, leaves his Alma Mater impressed with the fact, which cannot be avoided, that the United States practically controls the world's markets in certain goods and those goods are put out by those industries making the largest and most generous use of chemists.

In regard to the second class, the professional chemist, Lord George Hamilton in writing to Sir Alfred Hickman, M.P., ex-president of the British Iron Trade Association, among other things said: "Chemical research, concentration of capital, thorough technical education, improved industrial organization, have made in recent years greater advance in America than here; * * * ."—*Nature.*

Touching the education of technical chemists, the committee refers to President McMurtrie's timely address, 1900.

The rapid growth of chemistry in America has naturally developed undesirable phases, some beyond help, others that may be corrected. First, in many cases, there has been a tendency to permit many students to specialize before the proper foundation had been laid. The result, to be discouraged, has been the making of mere analysts, and not chemists, in the true sense of the word. The second, in a measure dependent upon the first, may be stated in the words of one of the respondents: "It seems that chemists are underpaid. While a furnaceman gets from $150.00 to $300.00 per month, the chemist gets from $50.00 to $100.00." Third, according to another respondent, "Our country is a long way behind the times in the matter of co-operation between manufacturers and universities." And fourth, there is

a notable percentage of chemists, practical and teaching, especially the latter, who are not members of any chemical society, according to the latest official registers of Germany, England, and America. A corollary is that there is a deficiency in knowledge of contemporaneous literature. A cause for complaint strongly emphasized by one of the respondents may be laid at the professors' doors; namely, the recommendation of students and graduates who have not fully qualified themselves for the duties. The chemical society ought to take some means to set the seal of approval on all graduates in first-rate chemical courses, and to disapprove of self-made and "half-made" chemists.

A statement of the new fields in which chemistry has become recognized as a necessary factor, according to the information given the committee, would be but an enumeration of most of the known industries, summary of the work of the experiment stations, soil surveys, sanitary commissions, and so on. This appreciation has not been uniform throughout the country by any means. It is a fact easily established that those sections of the country which have been most prosperous, or have grown most rapidly, utilize extensively the services of chemists. Old industries in new localities are more guarded by chemists: witness the oil exchanges in California and Texas; packing-houses in the middle states; manufacture of starch in the east; sugar in the middle west; cotton-seed oil and pine oils in the south.

This is largely an economic problem, for twenty-five years ago profits were immense and waste enormous. Now with competition, local and foreign, the value of waste is appreciated, and chemistry regulates the control of that waste. The chemist is appreciated in proportion as he pays. This is true where thrift and energetic competition have vied in industrial success. One informant wrote: "Twenty-five years ago I do not think there was a practical chemist in the whole northwest, * * * There are now fifty men employed in the twin cities."

Certain sections of the country beyond question need awakening. The teacher would and should do great service in throwing out suggestions as to what and how it is done in other sections than the one in which he lives. Dr. J. Lawrence Smith said: "We should do our full share in developing industrial chemistry," as, according to the address of one of our recent presidents, the pure and applied are interdependent and retrostimulating. It

cannot be regarded ill-becoming for a professor, however devoted he be to pure science if, in his social intercourse, he talks some "shop" as to the applications, when eventual good must be the outcome.

One of the difficulties, with certain manufacturers in sections where chemists are more highly thought of, is that graduates have gone to them claiming a skill they did not possess. The students should have better preliminary preparation, more time in college, and inducements for graduate work. Financial aids offered students wishing to specialize in chemistry are more numerous and valuable now than in 1876. This assistance is secured in the form of appointment to fellowships, scholarships, etc., the emoluments usually for service being from tuition and laboratory fees to $600.00 per annum.

Educational institutions still find it advantageous to import many chemicals and much apparatus. America produces heavy chemicals as pure and, considering the cost of transportation, etc., as cheap, as foreign manufacturers, but as yet little attempt is made by the American manufacturers to produce the finer organic preparations. This is due to several important factors, some concerned with legislation, as, for instance, untaxed alcohol, tariff, patent laws, etc. The committee is unable to furnish satisfactory statistics and information in regard to chemical manufacturers at present, as one member of the committee (Munroe) is the expert special agent of the Twelfth United States census in charge of that subject, and has prepared a lengthy report which will be published in due time by the government.

Satisfactory machinery for all kinds of manufactures can be secured from domestic sources; it, therefore, appears that the heavier pieces, like iron ware, electrochemical apparatus, platinum wares, etc., are to be had economically in America. For the more delicate and stable glassware, however, it is quite necessary to import. Manufacturers have noticed the tendency to favor home-produced goods and advertise thermometers, porcelain ware, etc., "Made in U. S." These deserve encouragement, but buyers are not inclined to pay too liberally for their patriotism.

It is claimed by some that there are no good American balances,[1]

[1] After this report was presented at the Denver meeting, a very excellent exhibit of balances of great accuracy was made by local manufacturers. The prices were high, however.

weights, etc.; that glass is inferior in quality and power of resistance to chemicals, and further there is much criticism of some dealers for substituting inferior goods. This is a clear business proposition, which offers an easy solution, but oftentimes serious inconvenience is experienced by institutions and chemists located great distances from the distributing points. The most promising encouragement for home-made apparatus of accuracy is offered in the recent establishment of the National Standards Bureau in the accomplishment of which the members of our Society took an active part.

A larger proportion of chemical students are turning their attention to pharmacy,—a most desirable state of affairs. Progress in that direction is shown by the many excellent, and some bad, preparations, coming from the drug houses. C. B.

TEACHING OF CHEMISTRY IN SCHOOLS, 1876, 1901.

Before comparing, or contrasting, the teaching of chemistry twenty-five years ago with that of to-day, it seems desirable to trace briefly the evolution of chemistry from a much earlier period. This will enable us to see at what part of the evolutionary line high school chemistry had arrived when the American Chemical Society was formed, and where it now is.

In the age of alchemy the effort was to conceal, not reveal, facts. All the language is most obscure, and writers are pervaded with the idea that the wrath of God will rest upon them if they reveal the secrets of their laboratories. Basil Valentine says he fears he has spoken so plainly that he shall be doomed at the last great day ; but the modern French writer, Figuier, facetiously remarks that all the adepts who have ever tried to decipher his language regard it as certain that he was one of the elect. There was no teaching, as there was no science. A little later when an alchemist disclosed the philosopher's stone, or the elixir, it was to a few persons for large money considerations. If he made pretended transformations into gold in presence of spectators, the *methods* were kept secret.

With the advent of scientific chemistry, even among the

phlogistians, secrecy became a lost art. Experiments began to be written about and talked of, but were not at first made in public. Books contained no illustrations. The question-and-answer method got into chemistry as in all other teaching. Jane Marcet's little book, "Conversations on Chemistry," first published in London in 1806 (which ran through 20 editions and was revised as late as 1855) set two generations to thinking of the marvelous revelations of nature. It consisted wholly of questions and answers, only the later editions being illustrated.

With the Lavoisierian chemistry, in fact antedating it somewhat, came the demonstrative lecture method of teaching. As the professor (for this was a feature of colleges and medical schools only) performed his experiments before the class, and called attention to the phenomena, which he explained either by phlogiston or according to the doctrine of Lavoisier, his hearers gained much. If there was still something of the alchemistic glamour, the subject could be studied afterwards in a suitable text-book. All in all, it was the most noteworthy advance in teaching that had taken place up to that time. As the question-and-answer method will never disappear from educational systems, so the best in the lecture method came to stay, and will always have its place. But it was far from being ideal, or final. During that period the man who could deliver the most faultless lecture was the best teacher.

But another step was to be taken, in which, in place of a passive observer, the student must prepare and set up his own apparatus, mix his chemicals, adapt the conditions, watch the phenomena, and arrive at conclusions. This was a more radical revolution than even the lecture method, and it merits more than passing notice. Liebig is accredited as the inventor of the laboratory method as applied to chemistry. This method, transplanted in America by one of his pupils, Eben Horsford, who in 1848 was appointed professor of chemistry at the Lawrence Scientific School, Cambridge, Mass., gained a slow and struggling popularity. It was at the same institution and about the same time that Louis Agassiz began to employ the laboratory method in natural science. In 1850 Professor Cooke fitted up, as a laboratory, mostly at his own expense, a basement room in University Hall, at Harvard College, where a few selected students were admitted. There was no gas or running water. After

seven years' work, against great opposition, he succeeded in having laboratory work a requirement for Harvard students in chemistry. The first laboratory instruction in chemistry for *medical students* in this country was in 1853 at the Harvard Medical School. It took another quarter of a century for the laboratory idea to permeate any but the larger colleges, and chemistry continued to be taught by the recitation method. One of the earliest, perhaps the first, secondary school to adopt the new idea was the Girls' High and Normal School, of Boston, about 1865. It was followed by the Cambridge, Mass., High School in 1866, and the English High, of Boston, in 1871. One of the early teachers says: "A chemical laboratory for pupils was a rarity; all foreigners and visitors to the city were brought to see it, and they opened their eyes in amazement at the strange sight." This was in 1870, and plans and photographs of this workshop for students were in demand from various parts of the United States.

But, generally speaking, the laboratory method, as regards high school, is a development of the past twenty-five years. A new era in chemistry-teaching was dawning. It was greatly stimulated by the summer schools of science which sprang up in colleges all over the land. The first teachers' school of science was that of Louis Agassiz' in natural history, held on the island of Penikese during the summer of 1873. In subsequent years this school, enlarged and broadened to include chemistry and other branches of learning, was held in Cambridge, Mass., the example of Harvard being followed by other institutions, and the laboratory idea was spread broadcast.

At first the workshop was usually put into the basement of the school building, and laboratory work was an extra subject, or voluntary exercise to be done after school hours by those sufficiently interested; hence, very little was required. As the work grew and its value became apparent, note-taking was introduced. "Observation" and "conclusion" made up the notes, mostly mechanical, without much connection. After a time, this being found insufficient, the teacher tried to put the student in the attitude of an investigator. He must describe the apparatus which he has himself set up, the chemicals and how he has mixed them, the operations he has performed; must trace the phenomena and try to ascertain what the experiment shows, must test

his products, and, so far as he is concerned, do real, original work. Finally, he must write out in fairly good English, all the above operations, observations, and results. Later on, when he becomes somewhat familiar with the principles of the science, problems of a practical nature are given him to solve—to make given compounds, or to separate mixtures. This leads on to qualitative analysis, a brief course in which is quite generally taken now in high schools, always following general chemistry and often put into a second-year course.

This accuracy of detail naturally led to two further developments: (1) a logical or scientific sequence of experiments; (2) quantitative work, which is one of the latest phases of this method. In fact quantitative work for beginners who have not had thorough training in general, qualitative manipulation, is still a doubtful experiment, one which the colleges, technological and medical schools, are so far answering, for the most part, in the negative. Those in favor of the scheme in elementary work reason that it inculcates greater accuracy and skill in manipulation than mere qualitative work, gives the student an idea of research methods, and makes his work complete. The opponents claim that to a beginner the underlying facts and principles of the science are of paramount importance, that the *qualitative* in evolution precedes the *quantitative*, and since time is limited, research methods are better suited to such students as pursue the subject further. A well-known teacher writes: "The attempts to beat out methods theoretically correct, the putting quantitative before qualitative, and the ignoring of the great primal facts which lead easily into those parts of the subject which concern the great body of men and women, have a tendency to lessen the interest."

The introduction of the laboratory method presented a new problem. When the text-book was the only feature, every chemistry hour was a recitation period. With the advent of the lecture table came a division of time between demonstration and recitation. The laboratory feature necessitated a further division, involving the question: How much time, relatively, ought to be given to laboratory, to lecture, and to recitation? In the solution of this question there has been no unanimity, rather the greatest diversity of practice, each school with its peculiar environment making its own answer. In some instances the entire time is devoted to laboratory work, and in such cases

the text-book is usually discarded. A new method always runs to extremes in individual cases. As a recent writer says: "Chemistry has suffered from the irrepressible wave of laboratory madness which has swept over the whole educational world. Laboratory work has been carried far beyond its limits, and things have been expected of it which it never did and never can do." It seems safe to believe that the problem will finally resolve itself into a proper equating of the time ratio between text-book, lecture work, and laboratory.

Another outgrowth of the last quarter is conference and reciprocal recitation (to coin an expression) in which the student becomes a questioner and the teacher recites and explains. The great value of this method, which may take up half or the whole of a recitation period, can be revealed only on trial. It shows what the teacher never knows beforehand., *viz.*, the standpoint from which a pupil views a subject, and that, after all, is the case to be diagnosed. The opposite view that nothing should be told the student, but everything evolved by a series of questions from his brain (callow and ignorant of first principles though it be), is still advocated by a few in authority. It is the inductive method gone to seed.

Applied to chemistry teaching the inductive method, though in use earlier in some schools, was largely a growth of the decade beginning about 1885. The first text-books avowedly inductive began to appear. Like other good things this Socratic, time-killing process was almost run into the ground by enthusiasts. Newth says: "In actual practice the *purely* inductive method of instruction breaks down. There is so much that the student is required to learn that life itself is not long enough, and certainly the limited time at the disposal of the student is all too short to admit of his going through the necessarily slow process of gaining this knowledge by his own investigation."

That part of induction which has the stamp of perpetuity consists in the teacher's quizzing the student while the latter is making an experiment. In this manner a world of thought and suggestiveness may be opened up to the imagination, and the method thus employed subserve a highly useful end.

In some schools the time allotted to chemistry is not more than it was twenty-five years ago, and certain laboratories blossomed into full maturity almost at the outset, but not so with the great

majority. The chemical theory is taught more effectively now than then by the use of charts and blocks. Laws which cannot well be shown by experiment are illustrated by simple mechanical devices and diagrams, so that, instead of mere words, the pupil can get a clear mental picture of the given law. Many problems in practical chemistry are introduced, and the bearing of equations, valence, and stereochemistry is studied as it was not twenty-five years ago. *Non multa, sed multum* is the watchword of the best teachers in chemistry, as in other branches. How much these improvements are due to the meetings, and the *Journal of the American Chemical Society*, it is impossible to state. In the dissemination of chemical knowledge this magazine has been a great power. The history of important chemical discoveries, and something of biography, is also taught in high school to-day. Instead of one text-book, students in the best schools have access to a large number of books, and are encouraged to do outside reading in scientific periodicals.

What, then, have we found in high schools as the result of our inquiry?

In 1876 a prevalent view that chemistry has little educational value.

In 1901 chemistry found in practically every high school curriculum.

In 1876 school committees very loath to expend anything for laboratories or equipment.

In 1901 the laboratory and lecture room among the first considerations in constructing a high school building.

In 1876 practically no laboratories, the text-book recitation dominant, very few demonstrative lectures.

In 1901 chemical work mostly divided into lecture, laboratory, and conference periods.

In 1876 no notes of work.

In 1901 notes containing description of apparatus, manipulation, chemicals, phenomena, inference, reactions, couched in more or less correct English.

In 1876 deductive methods almost wholly.

In 1901 methods partly inductive, partly deductive.

In 1876 the student committing facts to memory.

In 1901 the student more or less an investigator.

In 1876 a smattering of general chemistry only.

In 1901 both general chemistry and qualitative analysis, with some quantitative work, to illustrate laws.

The object and aim of chemical study in the two periods may be illustrated by excerpts from the prefaces of two books. The one in 1876 says that the author "has sought to make a pleasant study which the pupil can master in a single term, so that all its truths may become to him household words. This work is designed for the instruction of youth and for their sake clearness and simplicity have been preferred to recondite accuracy."

The 1901 author says: "The tendency of the present day is to make the student, from the very beginning, an *investigator;* to train and develop his faculties for observation; to make him find out facts and discover truths for himself; in other words, to make him *think* instead of merely committing to memory what others have thought."

What will be the next progressive movement in secondary school chemistry? Already a few dim shadows are being cast which may materialize. In schools of the larger cities there is a growing demand for elective courses and elective studies in every department of learning. Elective *courses* are not a new idea, but should high school pupils be allowed to choose *all their studies* throughout a three- or four-year course, it would profoundly affect the scope of teaching and indirectly the methods. Another coming event is the reaching down of chemistry into the grammar grades. This has been successfully done in some few cities and towns. Should the grammar grades teach chemistry and the high schools have elective studies, the higher grades of quantitative, volumetric, organic and theoretical chemistry may be forced into the high school, and a minimized college may result.

Another indication is that of co-operation. Chemistry teachers are beginning to form associations for discussion of methods and aims. There is at present a wide diversity in methods of chemistry instruction. While these can never be wholly unified, nor is it desirable that they should be, owing to varied environments, yet discussion of methods, aims, and results is most stimulating, and secondary schools may, in this respect, take a step in advance of colleges and universities. Magazines and periodicals for the discussion of what is latest and best in science teaching mark also the new era, and are an indication in the same direction. The *Journal of the American Chemical Society*, whose twenty-

fifth anniversary we celebrate to-day, may join hands with its infant sister, *School Science*, the youngest representative of scientific education.

From the twentieth century aspect of chemistry study, is it too much to say that it realizes more fully than perhaps any other single subject the ideal for combined manual, observational, and intellectual training? R. P. W.

With very rare exceptions, all institutions offering courses in chemistry insist upon complementary laboratory instruction which was not the case in 1876 (see Clarke's "Report on the Teaching of Physics and Chemistry," Department of Education, 1880). Information from the smaller colleges, purely academic in character, shows that they usually now have a short required course in chemistry. In 1876, a meagre course, usually of lectures, was required; now the subject is elective in the larger institutions.

There is great room for improvement in the smaller colleges along two lines:

First, the employment of men especially trained to teach the subject. It is well-known that men holding the Master of Arts degree have been employed to teach in some of the smaller colleges and their work has been assigned them after arrival. This is an evil and an injustice to science, more wide-spread than is imagined, and one which can be corrected without financial loss to those institutions. It is being met now (1901).

The second may be illustrated by the statement of one teacher, and needs no comment. "Most chemists in institutions like * * * * and other denominational schools are overburdened with other duties. For example, the undersigned has to teach algebra, geometry, trigonometry, analytical geometry, calculus, physics, botany, zoology, astronomy, physiology, etc., besides teaching chemistry. It is little wonder the science of chemistry does not advance more rapidly in such schools.

Very interesting and gratifying information has been secured, showing that while a larger number of students probably seek the degree of Doctor of Philosophy in Europe now than in 1876, the percentage is vastly less. The smaller institutions reported almost unanimously that their students seek the larger American universities for their final work. At the same time the greater home institutions report that many of the best men still seek

instruction abroad after having secured the American degree. The German degree does not possess, compared with the American, the same financial value it held in 1876.

We are inclined to think that some of the larger universities who train teachers of chemistry might profitably offer a course in chemical pedagogics, as the conditions at such places are by no means the same as obtain at the smaller colleges where many teachers must make their humble beginnings. Such would give a distinct advantage over foreign training.

It is unfortunate that, as yet, there is little exchange of graduate students for a term or so among American universities. Finances, arrangements of terms, time and hour credits, required residence, and competition for students are factors that interfere with the accomplishment of this desired end, which will doubtless shortly be solved for chemistry in the larger movement afoot.

But two phases of pedagogic chemistry which have not been touched upon in this report remain. Cornell reports: "Even today there are few of the larger universities offering courses in advanced inorganic chemistry." Such work is offered as a rule rather under the head of research work, and not in prescribed lectures. Lecturers on general chemistry at this date do not as a general rule confine themselves to the old routine, but base their outline upon the Periodic System, or a variation of it, so that the subject is exhibited to students more in detail and as a unit in less time.

Within the past twenty-five years there has been most gratifying progress in the teaching of medical students. Fuller appreciation of chemistry by the doctors of medicine has not come about through such vigorous reformation as advocated by Paracelsus. Bacteriological side-lights have illuminated the path, and in addition to the usual lectures on general chemistry, laboratory practice is universally required, and the best medical schools demand attendance on lectures on physiological chemistry and personal experimentation with many of the products of animal metabolism (see J. H. Long's address before Section C, American Association for the Advancement of Science, August, 1901, and reports of Connecticut Experiment Station by Atwater). Most gratifying encouragement has recently come through the generosity of Mr. Rockerfeller, who established the laboratory for medical research which cannot proceed without chemical aid.

It is to be hoped that the Department of Education in Washington will shortly issue another bulletin on the "Teaching of Chemistry," and place it in the hands of every teacher of the subject in this country.

FORMATION OF THE AMERICAN CHEMICAL SOCIETY.

BY C. F. CHANDLER.

Mr. President and Gentlemen of the American Chemical Society and Their Lady Friends:

The substance of my address which I had intended to give you this evening, has been presented so fully and ably by Dr. Hale in his discourse this afternoon on the history of the American Chemical Society, that it seems almost superfluous for me to discuss this subject further, still I cannot refrain, on this interesting occasion, from making a few remarks with regard to the early struggles which finally resulted in the building up of this great chemical society.

As has already been stated by other speakers, it was the centennial of chemistry which led to the organization of the American Chemical Society. When we were talking about celebrating the centennial of our Union a hundred years after the Declaration of Independence, the happy thought came to Dr. Henry Carrington Bolton that we should celebrate a centennial of chemistry. He wrote a letter to the *American Chemist* which was published in the April number of that journal in 1874, suggesting that as the year 1774 was rendered memorable by great chemical activity, that it could be selected with propriety as marking the beginning of the first century of scientific chemistry, and as Professor Joseph Priestley discovered oxygen on the first day of August, 1774, that day would be a very proper day to be selected as the natal day of modern chemistry, and that August 1, 1874, would be the proper date for a centennial celebration.

This idea met with general acceptance from the chemists of the country, and consultations were held and correspondence was opened with a view to organizing a celebration. The location of the centennial was suggested by a lady. Miss Rachael L. Bodley, professor of chemistry in the Women's Medical College of

Pennsylvania, wrote a letter to the *American Chemist* under date of May 1, 1874, suggesting that the grave of Dr. Joseph Priestley, at Northumberland, Pa., would be the most appropriate place to hold the centennial celebration.

This proposition was immediately accepted and the centennial of chemistry was organized, and was held on the 1st of August, 1874. About 100 chemists from the United States and Canada assembled there. They were received with open arms and lavish hospitality by the descendants of Dr. Priestley. The exercises were simple but very impressive.

Colonel David Taggart gave us an address of welcome.

Professor James Aiken delivered a very pretty poem to the chemists assembled around the grave of this renowned chemist, Dr. Priestley, written for the occasion.

Professor Henry H. Croft, of Toronto, Canada, presented a sketch of the life and labors of Dr. Joseph Priestley.

Professor Eben N. Hosford, of Harvard University, who established one of the earliest laboratories of this country, read several hitherto unpublished letters which had been obtained from the descendants of Dr. Priestley, and were of special interest.

Dr. Louis Laudy collected from the attics of Dr. Priestley's grandchildren, a considerable variety of apparatus which he arranged on three tables, as follows: First, astronomical apparatus; second, physical apparatus; third, chemical apparatus.

These groups were subsequently photographed; they were then sent to Washington and are to be seen in the National Museum there.

Dr. Henry Coppeé gave a most exhaustive address at the grave, setting forth Dr. Priestley's labors to benefit mankind.

Professor T. Sterry Hunt gave us an account of the century's progress in chemical theory.

Professor J. Lawrence Smith, who had distinguished himself in industrial chemistry as well as chemistry and metallurgy, gave us a most interesting account of the progress in industrial chemistry.

Professor Benjamin Silliman, Jr., whose careful study of literature and science produced among chemists a complete surprise, presented a most elaborate discussion of the work of all prominent American chemists.

The proceedings of the centennial of chemistry were published in full in the *American Chemist*, and were subsequently gathered together and published in a separate volume.

Altogether this centennial of chemistry was a most successful affair, and it was the first occasion on which a gathering consisting exclusively of chemists had been held in this country.

Naturally it occurred to many of those present, that it would be a great advantage to hold such gatherings of the chemical profession at regular intervals, and thus originated the idea of an American Chemical Society.

There were, however, serious difficulties in the way, owing to the fact that there were already several organizations in the country devoted to science in general, the members of which had worked diligently to create an interest in scientific matters, and who felt that an organization of a separate and distinct society of chemists would draw from the societies devoted to science in general.

The American Association for the Advancement of Science had organized a chemical section, and those who were particularly interested in the work of this organization feared that there would be no chemical papers for the annual meeting of the association, should there be an American Chemical Society organized.

The Lyceum of Natural History had recently been reorganized as the New York Academy of Science, and some of those who had worked diligently to build up this society, which held monthly meetings in the City of New York, feared that the organization of a distinct chemical society would draw considerable strength away from them, and for that reason they rather discouraged a separate and distinct organization.

On the other hand the chemists had a feeling that their numbers had so increased, that their needs made a separate organization necessary; that a society which covered the whole field of natural science could never meet the requirements of the chemical profession, no matter how interesting the proceedings might be. The chemists felt it was very desirable that they have an organization of their own where the members could come together and compare notes and stimulate each other with discussion.

After full discussion of the subject it was decided to organize the American Chemical Society. A circular dated January 22, 1876, was prepared which was forwarded to all the chemists whose

addresses could be obtained, asking cooperation. About forty responses were promptly received to this circular with assurances of sympathy and co-operation.

A second circular was then prepared, dated March 22, 1876, stating more fully the character of the proposed organization, and requesting signatures of chemists willing to take part in the organization.

In the course of a few days sixty favorable responses were received, and on March 27th, a call was issued for a meeting to be held on April 6th in the lecture room of the College of Pharmacy in the University Building on Washington Square. This meeting was well attended, and the whole subject of the propriety of organizing the American Chemical Society was discussed, and all the arguments for and against were presented.

It was then voted almost unanimously for the organization of the American Chemical Society, and a constitution and by-laws were presented and adopted.

On April 20th, the second meeting for organization was held. Edward P. Eastwick was elected president *pro tem.*

William M. Habirshaw, on behalf of the Nominating Committee, presented a list of officers and committees, who were unanimously elected, and thus on April 20, 1876, the American Chemical Society began its organized existence.

It was the determination of the founders of the Society that it should not be local in character, but should be a national society.

Owing to the fact, however, that there were many more chemists in New York City than in any other locality, it was unavoidable, at least in the beginning, that a majority of the members should be residents of New York City. Similar circumstances have prevailed in the organization of every other national chemical society. In every case the national chemical society is located in the metropolis, and the metropolis furnishes more members of the society than any other locality. This is true with the London, Berlin, Paris, and St. Petersburg chemical societies, and constitutes the strongest argument in favor of making the metropolis the headquarters for every national chemical society.

It was difficult at the outset to make the chemists living at a distance from New York realize the advantage of joining the chemical society, and for years the Society was chiefly supported

by those chemists living in or near New York City. Many of these chemists contributed most liberally of their time and means to the work of supporting the chemical society, and making its meetings interesting and attractive. While it was true that enough officers had to be selected from among the members residing in or near New York City to make it possible to secure a quorum and transact business, if you will run over the list of presidents, you will see that there have been but few New York presidents of the American Chemical Society: J. W. Draper, first president, resided in New York City, and at that time was one of the most distinguished investigators in the profession of chemistry and allied sciences; J. Lawrence Smith, Louisville, Ky.; S. W. Johnson, of Yale; T. Sterry Hunt, Montreal; F. A. Genth, Philadelphia; C. F. Chandler, Columbia University, N. Y. City; J. W. Mallett, University of Virginia, Charlottesville, Va.; J. C. Booth, Philadelphia; A. B. Prescott, University of Michigan, Ann Arbor; C. A. Goessmann, Amherst College, Amherst, Mass.; H. B. Nason, Rensselaer Polytechnic Institute, Troy, N. Y.; G. F. Barker, Philadelphia; G. C. Caldwell, Cornell University, Ithaca, N. Y.; H. W. Wiley, Dept. of Agriculture, Washington, D. C.; E. F. Smith, University of Pennsylvania, Philadelphia; C. B. Dudley, Altoona, Pa.; C. E. Munroe, Columbian University, Washington, D. C.; E. W. Morley, Adelbert College, Cleveland, Ohio; and William McMurtrie, New York, N. Y.

I make this statement in order to meet an allegation that was often made by some that the American Chemical Society was a New York organization.

Most of the presidents and particularly the earlier presidents were intentionally selected from among those residing at a distance. In fact but three of the presidents have been residents of New York City, while seventeen have been elected from other localities.

From time to time the proposition has been made by chemists residing at a point more or less remote from New York City, to establish another chemical society more national in character with headquarters in Washington, but after a great deal of discussion it was fully realized by the chemists of the country that the charter of the American Chemical Society and its organization, its history and its journal gave it advantages over any new

society that could possibly be organized, and the chemists of the country finally decided that the proper thing to do was to rally to the support of this Society and to increase its usefulness by creating sections which should hold meetings in their respective districts.

There are now twelve such sections including the New York Section, each one of which holds its monthly meetings for the reading of papers and other purposes, while annual and semi-annual meetings of the whole society are held at various places.

Thus we look back to-day over the twenty-five years of work and effort with great satisfaction. We now have a national chemical society so organized as to accomplish the greatest amount of good to the cause of chemical science in this country.

We are told by our secretary that we now have over 1800 members already enrolled on the list, 30 members have been elected but have not yet qualified, and chemists who are candidates for membership will bring up the number to 1930, and we have every reason to believe that it will not be many months before our membership will exceed 2000.

This result justifies all that was ever expected of the American Chemical Society, and we may well meet together to-day and congratulate ourselves upon the first quarter of a century.

One of the saddest things in connection with this assembling at the end of twenty-five years is the absence of so many who worked diligently to bring this Society to a success in the earlier years.

As I glance over the list of past presidents, I see that six have already passed away: J. W. Draper, J. Lawrence Smith, T. Sterry Hunt, F. A. Genth, J. C. Booth, and H. B. Nason. And a long list of the early members of the Society, of men who signed the charter and constitution at the time of starting the organization, a large proportion have passed away.

I have in my hand a note just received from Dr. Fred Hoffmann, who at that time resided in New York City, who maintained the greatest interest in the enterprise and was one of the organizers of the American Chemical Society, and who now resides in Berlin. Dr. Hoffmann was at Northumberland at the celebration of the centennial of chemistry, and worked diligently to help make the American Chemical Society a success.

I will now read the letter which is as follows:

"BERLIN, March 28, 1901.

"*Professor Dr. Chas. F. Chandler,*

"*New York City.*

"DEAR PROFESSOR:

"As the American Chemical Society is about to commemorate its twenty-fifth anniversary, I beg leave to ask you, with whom I and a few other contemporaries still living, have participated in laying the first foundation of an American Chemical Society in 1874 and 1875, the favor to express to the Society my cordial congratulations on the success which it has attained as well as on the fostering influence it has exerted upon the development and advancement of chemical science and industry in the United States during the last quarter of the nineteenth century.

"May the American Chemical Society continue to prosper and succeed as well in the century just begun.

"With kind regards to you and those members of the Society who may kindly remember me, I remain,

"Yours truly,

"(Signed) FR. HOFFMANN."

I do not know that I have much more to say upon the formation of the American Chemical Society. I look back with pleasure and satisfaction on all that has been done and the success of the movement.

I take pleasure in giving to Dr. H. Carrington Bolton the credit of proposing the centennial of chemistry, and to Miss Rachael Bodley the credit of suggesting the grave of Dr. Joseph Priestley, and of Dr. John W. Draper of accepting the nomination as first president, and I think it is eminently proper to mention at this time the names of the first officers: George F. Barker, corresponding secretary; Isidor Walz, recording secretary; William Habirshaw, treasurer; P. Casamajor, librarian. I would gladly mention the names of many others who were active in the early history of the Society, but there were so many that it is impossible to mention them all or to make any selection.

I cannot lose this opportunity which I have. I have always envied the clergymen. They have a hearing at least every week and the people are obliged to come, under the threat of serious punishment if they do not; consequently the clergymen have a chance two or three times a week to say what they think, and the people have to sit still and listen.

Now I have the invitation to address the American Chemical Society to-night, and having taken up as much of your time as I think proper to discuss the early history of the Society, I am not going to lose the opportunity to say some things which are not exactly pertinent to the subject assigned to me to-night, and will now venture to say something to this audience of assembled chemists with regard to the Chemists' Club, which was organized in New York City about two years ago in the rooms in which we are now assembled.

Every chemist knows that the literature of his profession has now become terribly voluminous and excessively expensive, and that no member of the profession can afford to maintain a complete chemical library, nor is any ordinary dwelling house capable of containing it.

I am told that about 800 books and journals come to the American Chemical Society every month ; it is almost as much as one person can do to take off the wrappers and place the books and journals in their proper positions in the library.

We have realized that something must be done to help the chemist,—the poor, miserable chemist who is expected not only to perform his daily routine of duties, but at the same time keep up with the progress of his profession.

Now the Chemists' Club has been organized for the purpose of assisting the chemists, and I will tell you exactly what we are going to do, and I want to say further that we have need of the support of every chemist in the country, but that there are enough chemists already pledged to this enterprise to carry it through, but we can do it a great deal sooner and better if we can have the support of the majority of the chemists throughout the country.

The resident chemists pay a pretty large membership fee per annum and they are willing to do so, for the reason that they can make daily use of the conveniences of the club.

We have secured these rooms, provided for mostly by New York chemists, who pay a pretty large fee for chemists. We are not lawyers, we are not doctors, and the fees are large for chemists in order to maintain this fine building and furnish a home for the chemical profession.

We propose to establish a duplicate chemical library. We hope to secure every chemical book published, and therefore, we

intend to maintain one library for reference and consultation, the books of which will not be permitted to go out of the building, so that every chemist who chances to come to the Chemists' Club may find every book he may wish to consult.

In another portion of the building we intend to maintain a duplicate library for circulation throughout the country, so that any chemist residing in any part of the United States may send to New York to the Chemists' Club and have forwarded to him any chemical books that he may desire to consult.

We propose to do much more than this. We will not only lend to any member of the Chemists' Club books which he may require, but we propose to keep one or more chemists on salary at the club to furnish information, so that when a chemist wishes to get information upon any particular subject, he may write to the club for list of books and articles on any particular subject in which he is interested, and have the books selected for him and sent to him. We will even have persons capable of translating German and French articles and of making abstracts.

We have been making a card catalogue of the chemists in the United States, and we believe there are at least 5,000 in the profession. If we could get 2,000 of these chemists to join the club as non-resident members and pay $5.00 fees per annum, we would then have a fund of $10,000; two-thirds of this could be expended in books, and one-third of it would enable us to secure the services of two chemists to supply information, and in a very few years we would have an extensive chemical library, and be able to realize all we hope for the club.

Of course, if the majority of the profession wait to see whether it is going to be a success, the success will be slow, but I may say that we mean to make it a success. I think the object is worth working for, and I am happy to say that there are a great many other chemists who have the same feeling, and who are now devoting their energy and their means to working out this plan.

We have not been able to hire any chemists as yet, but Dr. Bogert, our secretary, and several other members are doing what they can to furnish information to those who write for it, and I want to present this matter to the entire profession of this country; every chemist should realize the advantage of this work, and

each one should undertake to do his little part towards carrying it out.

In closing my remarks, I can only say that I hope the scheme for the Chemists' Club may receive the hearty support of all those who have come here to celebrate the twenty-fifth anniversary of the American Chemical Society.

THE DIGNITY OF CHEMISTRY.

BY H. W. WILEY.

Chemistry as a profession may be said to have completed its hundredth year, and we have met to-night to celebrate the quarto-centennial of chemical organization in America.

In our democratic country, all attempts to create a class or caste should be discouraged, especially if the attempt be made to endow the class with unusual or special privileges. We have no place for an hereditary or a purchasable aristocracy, but in the function of the civic body there must be specialization, and those individuals who by choice or fortuitous incident devote themselves to special duties are brought together by occupation, by congeniality and by desire for mutual helpfulness and improvement. In this mutual attraction we find the genesis of all trade and professional organization. The aggregate is always stronger than the segregate. This unity of purpose and this conformity of effort become reprehensible only when autocratic, imperative and insolent. The assumption of superior virtues, the assertion of peculiar privileges and the interference with the rights of others are never to be advocated nor condoned.

Every honest effort to earn a living and a competency is worthy of equal praise, and therefore in dignity of effort there is no rank. The workman in the woods, the farmer in the fields, the artisan in the atelier and the mechanic in the mill have an equal claim to the dignity of labor with the preacher, the lawyer, and the professor. There is no form of labor which is beneath the dignity of any man. Instead of being a curse, labor is the greatest blessing which Providence, fate or evolution has conferred on humanity. Tolstoi, one of the greatest of living novelists, earns his living from the soil. Peter the Great was a carpenter and is said to have done much of the work in building the old palace at Peterhof. Louis XVI. was a locksmith. Washington was a farmer, Lincoln a rail-splitter, Grant a tanner, Garfield a canal boy. The natural and normal desire of men who have achieved greatness is for a piece of land where they can be in touch with the great mother of us all, the soil. To him who appreciates the true dignity of labor, no task is menial. The

hands are made for toil as much as for fighting, and sweat is the most efficacious of all detergents. In derision on one occasion the Romans made Cato commissioner of sewers, but he discharged the duties of his menial office with such industry and benefit to the city that thereafter to be made commissioner of sewers was considered to be a distinguished honor. Thus the true philosophy should teach us that our calling in life is a *cloacum magnum* which we are to administer, not with closed nostrils, but with open eyes and hands that do not recoil before thickened cuticle and stains.

He who is not proud of his profession is not worthy of it. This does not mean that his profession is any better than another, but when the heart is not in the work the head is sluggish and the hands are slow. Nor do I mean that a profession should not be regarded as a means of making a living. On the contrary, that is the first and chief end of any occupation. The number of persons who work alone for the love of it is exceedingly small. Perhaps there is only one profession where it is better that a man be rich, and that is the profession of politics. Making a living out of a public position is the most precarious of all professions, and there is no collection of dependent fossils which appeals so pathetically to general commiseration as that vast aggregation of exes which lingers near the cupola of the Capitol. The *functus officio* faster has fed so long at the public crib that he knows not the taste of other food nor the means of getting it. The last of his life is an eternal Lent on which no Easter morn of soothing satiety will ever rise.

In one short walk a few days ago, I met one ex-senator and two ex-representatives, who a few years ago were farming patronage and feasting on lobster Newburgh at Chamberlin's, who are now seeking to be attorneys for the holders of claims that live only in the hope that a far-off indulgent future will no longer know their worthlessness. Hungry are the looks of these men, with jaws cavernous as those of Cassius, sad warnings of the fate of a statesman out of a job. A profession, therefore, should offer some guaranty of a livelihood dependent on merit and industry, and not upon the whim of a capricious public.

It is not my purpose to-night to discuss chemistry as a living-provider. Often young men come to me and ask my advice in regard to choosing a profession. They come often with a strong

inclination to chemistry and want to know what I think of the prospects for success. If they have already studied chemistry, I invariably ask: Have you a taste for chemistry? Do you love chemical studies? If they do not know, or if the answers are indefinite or evasive, my advice is always, 'Stay out.' But especially is this so if they propose to study chemistry as a profession because it is an easy road to wealth. Alas! the paths of chemistry seldom lead to 'easy street.' True it is, you rarely see the chemist begging bread. Perhaps he knows too well of what it is composed. The chemist tramp too, is a kind of *rara avis in terris cygno simillima nigra*. The chemist may be able to change phosphorus into arsenic by oxidizing it in presence of ammonia, but even so distinguished a man as Carey Lea could only make silver yellow, and further than this scientific transmutations have not extended. Fortunes have been made by a few. A happy discovery in metallurgy or in manufacturing processes has often brought a modest fortune to the inventor, but most of the roads leading from the Patent Office end in the cemetery of hopes at first vigorous from the pliant pabulum labeled 'Having now described my invention what I claim is,' etc., 'substantially as set forth.' The parchments with the flaming seals that protect you in the sole usufruct of your genius for a period of seventeen years serve most frequently as fitting cerements for the deceased. If the chemist be a teacher or employed at a salary, the prospect for a competence is not much better. At best these stipends are not very large. In a manufacturing enterprise, the chemist often becomes the manager, and in this case he can put by something for 'a rainy day.' If a professor, he sometimes gets to be the president of the college, provided his theology is untainted. But Universities of Chicago are not found in every academic grove. Most of our institutes of higher learning are chronically impecunious, and even the professional chair is not upholstered with a cushion which would tempt the expectant Croesus.

In general, then, it must be admitted that whatever of dignity is due the profession of chemistry is not attributable to its tendency to wealth.

I am not of that school which despises wealth, nor yet of the cult that loves it. Poverty, doubtless, has its uses in evolution and molding of character. Wealth often corrupts youth and makes of manhood but a purveyor of vice. But poverty also in-

vites crime, and it is not the most efficient preservative of virtue. A modest competence, possibly, is the ideal state, best suited to highest development and greatest usefulness. It is not always dignified to be in debt. For this reason, I should like to see the influence of this great organization, whose foundation we celebrate to-night, exerted to secure better pay and more permanent employment for its members. I know this seems sordid and mercenary, but we must not always live in the clouds. The cerulean atmosphere will be more gratefully stimulating and its views be more thoroughly appreciated if we manage somehow to keep our feet well braced on *terra firma*. To him who cannot swim, things begin to feel a little queer when the advancing tide leaves him touching only a little flowing sand with the tips of his toes. Good and steady pay to its devotees is no small contribution to the dignity of chemistry.

The pursuit of science is nothing else than an effort to know something of the constitution of the natural world. That knowledge is not derived from an ingenious system of vain imaginings, but is secured by a study of nature herself.

"To him who in the love of nature holds communion with her visible forms she speaks a various language," sang one of our great poets at the age of 17. Had he lived until he was 100 and grown in wisdom every year he could not have uttered a truer note. The language which nature speaks to the chemist is a description of the ultimate nature of things. It is to the chemist that nature teaches the alphabet of human knowledge. In this sense the chemist comes nearer than any other to first principles. As we grow in knowledge, we sometimes forget our small beginnings. And so it sometimes seems to me that our professional brethren of other schools are prone to despise the day of little things. Atoms and molecules are too small to cut much of a figure in the economy of nature, think some. But it is no true mark of greatness for the macrocosm to forget the microcosm. A megatherium is not the 'whole show.' It is true that in some respects chemical achievements appeal least of all scientific accomplishments to the popular attention. The isolation of krypton does not have half the interest for the public that attaches to the discovery of a new bug, especially if it have domestic tastes. In fact all the biological sciences find a readier and more appreciative public than those with the possible exception of physics,

which deal with things lifeless and for the most part incomprehensible to the layman. This truth is uttered in no complaining mood, but only to explain why Davy is not as well known as Darwin, nor Hoffmann as Haeckel. It is when chemical studies and discoveries come directly into contact with life that they lead to recognition, as in the case of Pasteur, whose great genius is recognized the world over, perhaps more generally than that of any other scientific man has ever been. But it is not alone for public applause that life is worth living, and the dignity of our science suffers no depreciation because of its apparent remoteness from human interest. I say apparent, because I do not believe that any other science has in reality any nearer bearing on human welfare than chemistry. Think for a moment how many of our industries that lie at the foundation of wealth and progress are based directly on chemistry. Think of the many others that are intimately related to it indirectly. If the clock of political progress and liberty were turned back fifty years by the battle of Waterloo, think of the loss to humanity should such a disaster befall the hosts of chemistry. Bourbonism is the natural foe of human progress, and unhappily the world is still full of antiscientific Bourbons.

Whatever may be the branch of the profession which the chemist may pursue, he should not be indifferent to feelings of justifiable pride which come to him when he realizes all that our science has done for humanity. The disciples of evolution may have attached some opprobrium to the epithet, but the chemist is the 'connecting link' between the world of matter and mankind. We stand the nearest of all our brethren to the ultimate constitution of things, so near, in fact, that we almost tremble at the thought that by some subtile synthesis we may yet strike the spark of organic life. Of one thing at least we may feel sure. We know best of all our brethren the environment of development and growth. We may never create an environment which will make autogenesis possible, but we surely can soften some of the harder conditions of existence. To be so near the first forms of life, to be so nearly in touch with the ultimate secrets of nature, are facts which show some of the principal elements of the dignity of chemistry.

No man can lay claim to the term scientific who does not reverence the truth. That is the first element of a scientific mind.

The truest proof of a reverence for the truth is a willingness to be convinced. In the times of Cromwell, the truth was supposed to be simply the dogmas of the creed, which led Butler to say :

> " He that complies against his will,
> Is of his own opinion still ;
> Which he may adhere to, yet disown,
> For reasons to himself best known."

The most difficult mental attitude, which the scientific man has to contend with in his struggle for the truth is bias. We inherit, in a measure, certain notions of things and of life. This natural inheritance is strengthened by the earlier teachings of childhood, so when we reach the age of maturity we have formed certain opinions, we are endowed with certain habits of thought which tend to dominate our mental attitude. Happily, most of these habits and most of these inheritances are sound, but now and then we find one which is clearly opposed to the conditions of existence as science reveals them. How difficult in this case to let go the old notion ; how hard to bring one's self into an attitude to receive the truth ! Perhaps it is only a species of conservatism which leads man to hold on to that which he has, and in this sense a certain difficulty of conviction is a guaranty of stability of thought and of social, economic and political conditions. In other words, we should heed the warning in the Bible and not be swayed by every ' wind of doctrine.' The tendency to too eagerly accept is more reprehensible than tardiness of belief. We have all seen wave after wave of illogical belief sweep over the country, and no difference how absurd a theory may be or how impossible a course of action which is marked out, it finds plenty of adherents. This instability tends to render all the conditions of natural growth and development precarious. The scientific man must be on his guard against being buncoed by any plausible or specious doctrine, as well as keeping his mind open for the acceptance of the truth. Here a man's judgment comes into play, and not only should the scientific mind be open to conviction, but it should also be controlled by a sober and discreet judgment which can discriminate between the true and the false in evidence. But when, soberly considered, certain facts are brought home with an overwhelming evidence of truthfulness, the results of this evidence should be accepted, no matter how contrary they may be to our preconceived notions. Perhaps the

greatest offense in this direction which the scientific man commits is a distortion of evidence to suit the case. By a slight inclination this way or that from the true point of direction an observed fact may be made to support this or that theory or condition. I am far from belittling the value of theory. When formed on substantial evidence and with a becoming ingenuity it is a valuable aid in the discovery of further truth, but a theory should never be a fetich to be reverenced and worshiped with the blind devotion of the religious devotee. There is nothing sacred about the theory. It is only a valuable tool to be cast aside when a better or more effective one is at hand. The dignity of our profession, therefore, has been strengthened and increased by the habit of the chemical mind of accepting the dicta which experimental evidence has provided. Detracting somewhat, however, from this dignity has been the fact that certain contentions have arisen in our profession over the interpretation of ascertained phenomena. Chemists may agree upon the character of certain phenomena which are presented, but construe them differently, and often with acrimony. A scientific discussion should be conducted with all the dignity of a scientific dissertation, and the honest differences between chemists should never be allowed to degenerate into personalities or innuendo. There is no excuse whatever for speaking slightly of the honesty or ability of a brother chemist who may happen to differ from you in his opinion of phenomena. Envy, backbiting, slander, and scandal have no place in the chemical profession. I believe every one will admit that there has been less of it in the profession of chemistry than in almost any other. We know to what extent the personal quarrels among many scientific men have been carried in this country, and we are glad to say that there is no instance in which these quarrels between chemists have come into our organization to influence our action and mold our policies or to cause the growth of faction and the promotion of feuds.

There is enough for every one to do in this country without wasting his energies with envy of the accomplishment of others. About the most unprofitable occupation into which a man can fall is to complain of a lack of appreciation. It is doubtless true that in many cases the worthy man is cheated of his dues and the unworthy receives a reward out of all proportion to his services. These are accidents, which are due to the imperfection of human

nature, and not to any peculiarity of scientific pursuits. There should be room for the philosophy of life in chemical science as in every other. The sensible way is to accept what happens, and not to degenerate into a kicker or the carrier of a club. The chips which are found on the shoulders of our associates are usually magnifications of the motes in our own eyes, and not due to the deposition of any really ligneous material upon the clavicle of our supposed enemy. We have plenty to do in this world without going about knocking off hypothetical chips. I have the profoundest sympathy for the man with a just grievance, and I know how many have them, but there is no greater nuisance than this same man with this same just grievance. The man who shuts his mouth, compresses his lips and bears the pain and humiliation without a sign is the one who wins our admiration in the end and often turns disaster into good.

With a proper appreciation of the dignity of our profession, we will therefore do our work as well as we can and be glad of the greater success of our professional brethren, and not find in it a cause of sorrow and dejection. Every man who succeeds in chemistry does a work to elevate our profession and to help us all, and therefore, even from a selfish motive, we should be glad of his achievements. I realize how hard it is to see others preferred when we feel convinced that the prize belonged to us, and yet I must be allowed to praise the courage of the man who, with a smile on his face and a true feeling of well-wishing in his heart, can congratulate the more successful man not with hypocritical words, but with a real sentiment of satisfaction.

There is one special way in which I think our great organization can do much to elevate the dignity of chemical science. I have spoken of the fact that chemistry does not appeal directly to the public imagination, and for this reason many of our best people do not have a true appreciation of the value of chemical services. An honorable and praiseworthy part of our profession is the rendering of professional services of a chemico-technical nature to the great industries of the world. Too often the promoters of these industries, the men with the money, the men on the boards of directors, and the stockholders, do not appreciate the real value of the services they ask for. A rich corporation is perfectly willing to pay a great lawyer $10,000, $15,000 or even $50,000 for professional services, whereas if a chemical expert

should ask $1,000, it would produce a kind of corporative hysteria or nervous prostration, while, in point of fact, the technical services demanded would probably be of far greater financial utility than the legal services so much more liberally remunerated.

There has been a tendency among some of our profession to foster this spirit of contempt for the value of chemical services of a professional nature, not intentionally, I am glad to say, but because of a feeling, which I can hardly describe, that it is not dignified for a chemist to sell his services for money. The falseness of this position, it seems to me, has been fully set forth in the earlier part of this address, and I believe that every right-minded person will admit that it is not derogatory to dignity to receive pay. Otherwise, I would think that we should cast dignity to the winds and look out for the 'main chance.' In my opinion, it is just as honorable and worthy to give professional advice to a great industry as it is to discover an unknown element. In our Society we should have far more *esprit de corps*, more regard for the rights and privileges of each other, and a better understanding of the ethics of our profession. It is true that we now act upon the principle that it is dishonorable to take an investigation out of the hands of a brother who has once commenced it, without his permission, or in any way to trespass upon the fields which he has preempted. In like manner we have learned that it is dishonorable to underbid a professional brother in offering our professional services. It seems to me that the Society can do a great good towards promoting the dignity of our profession in this way by establishing not a hard and fast schedule of prices for professional services, but by bringing closer together our members who give these services so they may have a better understanding of the rights and privileges of each other. Other professions do this, especially the medical, and great benefit would be derived from a better understanding in regard to these matters.

Especially is this true from the effect it would have upon the public at large who, seeing a profession stand together and in a dignified manner demand what is right and just, would better appreciate the value of the services which they often hope to get for the very smallest possible consideration.

Perhaps the bitterest criticism to which the chemist has been subjected has grown out of his services as expert before the courts. Here we often have the spectacle of two men, under oath, one in

affirmation, one in negation. It is only natural that the expert should favor his client, but that favor should never go so far as to impugn the truth. Where there is room for disagreement, I can see no impropriety in the chemist supporting with all his ability the side that employs him. He is not hired to discuss the whole problem in all its aspects, but to develop those points which make for the benefit of his employer. We cast no reflection on the honesty of the lawyer who defends, nor should we on the rectitude of the witness who testifies. But no worthy chemist will deliberately undertake to support a falsehood. Whatever of viciousness may attach to expert evidence is the fault of the system rather than of the witness. We all admit that it would be far better for the court to employ the expert, and not the plaintiff or defendant. But until that change has been made, the chemist is undoubtedly right in making out the best case possible for his client, provided he distorts no facts.

How far the chemist can go with patent medicines, nostrums, and secret preparations is another story. The dignity of our profession forbids any taint of humbug or quackery. This field, therefore, seems to be absolutely closed for professional purposes.

I would not have our Society become a trades union, and especially would I be sorry to see it exercise the tyranny which such unions of en manifest, but I would like to see a better understanding established in matters of this kind, both for the sake of our members and for the benefit of the public at large.

The dignity of the profession of chemistry is illustrated in a striking way by the active participation which it exercises in many of the greater walks of life. I have not time here to go into statistics and show the relative number of chemists employed in the industries as compared with members of other scientific professions. We will admit without such an array of figures that there is no other scientific profession, with the possible exception of physics, which begins to be so numerously represented in the great industries as the science of chemistry, and even in the case of physics, aside from the electrical industries and those of a purely engineering character, the physicists engaged in the active industries are not numerous.

When it comes to mining engineering, we find that the engineer himself must be a chemist in order to be fully able to discharge the duties of his profession. In so far as statistics are

concerned, I will content myself with a few citations showing the preponderance of chemical employees in the great scientific agricultural industries of our country.

In a study of the impress which chemical research has made upon agriculture, there has been no factor during the past twenty years which can compare with the work of the agricultural experiment stations of the United States. Richly endowed as they are by the general government, they have had every opportunity to secure the best results for practical agriculture.

In this work chemical science has played a very important part in the furthering of agricultural prosperity. Of the forty-nine directors of the stations at the present time twenty were professional chemists at the time of their appointment. The selection of so many professional chemists was no mere chance, but evidently had some relation to the dominant position which the science of chemistry holds to the promotion of agricultural chemical research. The list of directors of the agricultural experiment stations of Germany shows the same condition of affairs.

The great influence of chemistry on the agricultural experiment stations of this country is not measured alone by the number of professional chemists which is found in the directorates, but also by a comparison of this number with that of other scientific men holding similar positions. Very few of the other sciences are represented among the directors of stations, and no one of them can compare in its number of representatives to the science of chemistry. Among the working forces of the stations chemists also predominate. There are twice as many chemists employed in the stations as there are men engaged in any other professional scientific work. Statistics show that the number of chemists employed in the agricultural experiment stations of the United States is 157, while the number of botanists is 50, and the number of entomologists 42. The number of employees belonging to other branches of science is very much less than that of the botanists and entomologists, and the total number of scientific men employed in all other branches of scientific work in the station does not greatly exceed, even if it be equal to, the number of those employed in chemical research alone.

While dwelling upon the predominance of professional chemists in the directorates and upon the staffs of the experiment stations, it seems eminently proper to mention here in a special manner

some of the earlier eminent chemists who have contributed so much to the value of chemical research in our agricultural colleges and experiment stations. Among these must be reckoned Professor F. H. Storer, of the Bussey Institute (Massachusetts), who first began the regular publication of a bulletin recording the work of the school and station, which has 'set the step to which the bulletins from many other stations are still marching.' The bulletins of the Bussey Institute describing original research work on agricultural subjects have proved of the highest benefit to agriculture. Professor Storer's work, entitled 'Chemistry in Some of Its Relations to Agriculture,' the first edition of which was published in 1887, has had a marked effect upon agriculture in this country.

As early as 1846 Yale University, then called Yale College, appointed a professor of agricultural chemistry. This was John Pitkin Norton, who had devoted himself to the study of scientific agriculture both in this country and in Europe, especially with the celebrated Liebig. He brought to his position a ripe knowledge and wisely directed enthusiasm for agriculture, which he used with the greatest profit in its service. In 1855, Samuel William Johnson was appointed instructor in agricultural and analytical chemistry, and soon after full professor. Perhaps no one ever succeeded more fully in popularizing scientific agriculture than Professor Johnson. His two books, 'How Plants Feed' and 'How Plants Grow,' the first editions of which were published in 1868 and 1870, respectively, have been kept abreast of modern progress in successive editions, and are still used as standard text-books and as authorities on the practical relation of chemistry to agriculture.

In the University of California, the work of Professor E. W. Hilgard must be mentioned as being of fundamental importance in the development of the relation of chemistry to agriculture in this country. Professor Hilgard, in his classical work on soils, has placed himself in the front rank of investigators on this subject, not only in this country, but in the world, and his achievements have been recognized both by his countrymen and by the most celebrated societies of Europe. A knowledge of the soil and its relation to plant growth constitutes one of the fundamental principles of agricultural chemistry, and the researches of

Professor Hilgard in this line have done much to place agriculture in the United States on a strictly scientific basis.

At Cornell, even before her doors were open to students, a professorship in agricultural chemistry was established. Professor G. C. Caldwell was appointed to fill this position, and he has done so with distinction to himself and to the university and with the greatest benefit to agriculture. One of the most important services in connection with Professor Caldwell's labors at Cornell was the publication of his work on agricultural chemical analysis in 1869. At that time no work of a similar nature existed in the English language, and Professor Caldwell's book was a veritable boon to students in agricultural science.

This brief reference to the contributions of some of the earlier workers in agricultural chemical science in this country would not be complete without mention of the labors of Professor C. A. Goessmann, of the Massachusetts Agricultural College.

It is not possible in the space assigned to this address to even name the more prominent later workers.

A national epoch in agricultural education in this country began with the passage of the Morrill Act, in 1862, establishing and endowing colleges where agriculture should be one of the principal branches in which instruction is given. An additional impetus was given to this great work in 1887 by the passage of the Hatch Act, establishing agricultural experiment stations in the several states. The organization list of the agricultural colleges of the United States now shows the great number of men working in agricultural chemistry. This most remarkable evolution of agricultural education has taken place practically within the last thirty years, and there is no country which can now be compared with the United States in the munificence of the endowment for agricultural chemical research or in the vast amount of research and experimental work conducted along these lines.

Another way in which our profession has influenced higher education in this country is found in the large number of chemists who have been called to preside over our higher institutions of learning. Of the leading institutions in this country, Harvard University, Lehigh University, the University of North Carolina, the University of Tennessee, Johns Hopkins University, and Purdue University are presided over by professional chemists, or

rather, I should say, by those who before elevation to the presidential rank were professional chemists. I doubt if any other branch of science can show so many college and university presidents[1] as our own. It is certainly not a mere accident that in the breaking away from the old scholastic habit of placing ministers of the gospel over institutions of learning, chemistry has received so marked a favor. In fact, the pursuits of chemical science, it seems to me, tend more than other scientific occupations to broaden the mind and to bring it in contact with all the varied industries and forces of active life. It is true that other branches of science have their economic aspects, and we do not by any means desire to minimize that important relation, but they do not come so generally into contact with human affairs. While they appeal in the nature of their services more to the public imagination, when it comes to real practice they do not have that influence which our own science possesses.

I am far from saying that the pursuit of chemical studies tends, in any peculiar way, to develop administrative ability, and hence it cannot be in this collateral way that so many of our brethren have reached these higher places of administrative effort.

While we do not claim that chemical science holds in any way the same dominant position in didactics that it does in agriculture, we do find, even in the smaller institutions of higher learning, that, as a rule, chemical science is taught more thoroughly and more effectively than other branches. The consideration of these facts, if prominently brought before the attention of the public, would certainly do much to increase the estimation in which our profession is held.

The above only illustrates in one industry the dominant influence of chemical research, and in so far as science comes into direct contact with the industries of the world it is evident that in almost every one chemistry occupies the predominant position. This well-recognized fact is a firm basis for the substantial claims of the dignity of our profession.

There is one point, however, in which it seems to me we are much at fault, and that is in the fact that the chemists of this

[1] In *Science* for September 5, 1902, is an interesting study of the degrees of Doctor of Philosophy conferred by the universities of the United States for studies in the sciences for five years, from 1898 to 1902 inclusive. In every instance the degrees conferred for chemical studies were larger in number than for any other one science, the total number of degrees in chemistry conferred in the five years being 137, more than double the number given for any other science.

country seem to have taken but little interest in the science of civics. We are too prone to regard politics as a profession beneath the dignity of a scientific man, and yet we must admit that the organization of the body politic for the public good is the highest work to which a man can devote himself. In other words, real politics is the most useful and most honorable of professions. The trouble here in this country is that politics becomes too much of a profession. In other words, it becomes a source of revenue or of sole revenue. How much better it would be if men who have reached success and competence in other professions, without abandoning these in their maturer years, would devote a portion of their time to the public good! In Europe this is commonly the case and we are all familiar with the names of eminent scientific men who have become celebrated also as leaders in political life. In Germany, we recall the name of Virchow, who, for more than thirty years, has been a member of the National Legislature, and of Mommsen, the great historian, who has taken an active part in politics. In Italy, one of the honorary members of our Society, Cannizzaro, is a senator and vice-president of that body. In France Berthelot is a life senator and has been minister of foreign affairs. In England, Roscoe has been a member of Parliament, and Faraday and Humphry Davy and other scientific men were active in public affairs. In our country, I believe, only one member of the Chemical Society has ever become a member of the National Legislature and this was due to a fortuitous combination of most incompatible elements, namely, a union of democracy and prohibition.

I think we should all strive to discourage this sentiment, which is so prevalent, that politics is a dirty pool and that men of science should keep out of it. When you have reached competence and distinction in your profession what better service to which to apply your leisure hours than the study of the public weal? There are so many ways in which science can be utilized in political and civic affairs. The conservation of the public health, the prevention of epidemics and contagious diseases, the control of the water supply of cities, the disposal of the refuse of cities, the study of dangerous and fraudulent counterfeits of foods, are all matters affecting directly the public health and the public welfare, are some of these avenues of public benefit. To become interested in these matters would be to participate more

actively in public affairs, and it seems to me it is an ambition which every scientific man might well entertain, not only to become eminent in his profession, but also to devote a portion of his more mature life to the study of the public welfare and to active participation in those political relations of life which will enable him to become more useful to humanity.

May we not then expect to see the day when our State and National Legislatures shall not be considered as properly organized until they have among them members representative of the great body of American chemists?

On April 12, 1976, will be celebrated the centenary of our society and shortly thereafter the bicentennial of our national independence. May I drop for a moment the rôle of chemist and assume that of prophet? Our country will have then about 225,000,000 inhabitants. Our foreign export trade will amount to more than $5,000,000,000 annually. The revenues and expenditures of our government will each reach the annual sum of $4,000,000,000. The average yield of wheat in the United States will be nearly 25 bushels per acre, and the average yield of other field crops be proportionately greater than now.

Diversified manufacturing industries will flourish in every part of the country, thus distributing population and encouraging agriculture. The product of a day's labor will be double that of to-day, thanks to new processes, improved machinery and greater skill. The condition of the artisan and the laborer will be greatly ameliorated, and the principles of the trust, which now help chiefly the capitalist, will be extended to include the working man as well. The laborer will not only have a larger daily wage, but will also share in the legitimate profits of the business.

The advancement of chemical science will not only make the fields more productive and more easily tilled, but will also teach how their products can be more economically and easily consumed. Good roads will lead everywhere and the horse be relegated to the museum and the stable of the sportsman. New sources of energy will take the place of coal and gas, and this energy will come from the winds and the rains. The sun directly and indirectly will monopolize the power of the country, working through evaporation and precipitation and by means of electricity or some more useful force.

By a general comprehension of the principles of nutrition, food

will be more wholesome and more potent. The general acceptance of the principles of hygiene will make the average life of man longer and his usefulness more fruitful. Man will not only live longer, but he will be happier and practically free from the threats of enzymic, contagious and epidemic diseases. When this Society meets on that founders' day, the membership will be nearly 10,000 and its organization will reach to all quarters of our imperial country. The number of those who to-day are members and who shall live to 1976 is not large, possibly *nil*, but many who are infants to-day will be the revered old men on that centennial occasion. The orator who will address you on that day is perhaps not yet born. I hope he will take for his theme, the 'relation of chemical work to the advancement of mankind in the past century.' He will find in the development of some of the thoughts which I have tried to bring to your attention to-night the most potent causes that make for the good of man. In such a light as that orator can shed on life and its conditions the coming man will be able to see the true dignity of chemistry.

LIST OF PERSONS REGISTERED AS ATTENDING THE TWENTY-FIFTH ANNIVERSARY MEETING.

G. C. Caldwell ..... Ithaca, N. Y.
E. E. Smith ..... New York City.
J. F. Geisler ..... New York City.
Wilder D. Bancroft ..... Ithaca, N. Y.
Charles F. Chandler ..... New York City.
Martin L. Griffin ..... Mechanicsville, N. Y.
J. F. McGregory ..... Hamilton, N. Y.
Clifford Richardson ..... Long Island City, N. Y.
F. W. Clarke ..... Washington, D. C.
Paul Blakeslee Mann ..... Nyack, N. Y.
Charles A. Doremus ..... New York City.
J. W. Mallet ..... Charlottesville, Va.
L. A. Youtz ..... New York City.
G. A. Prochazka ..... New York City.
Edward A. Cary ..... Montclair, N. J.
L. C. Condit ..... Brooklyn, N. Y.
Marston Taylor Bogert ..... New York City.
Leopold Boroschek ..... New York City.
Kaufman G. Falk ..... New York City.
W. Paul Pickhardt ..... New York City.
Richard K. Meade ..... Easton, Pa.
C. P. Van Gundy ..... Baltimore, Md.
J. G. Lipman ..... Ithaca, N. Y.
Herman J. Lohmann ..... Jersey City, N. J.
Chas. W. Mudge ..... Geneva, N. Y.
Chas. Baskerville ..... Chapel Hill, N. C.
T. J. Parker ..... New York City.
Wm. F. Hoffman ..... Newark, N. J.
H. J. Krebs ..... Wilmington, Del.
A. S. Krebs ..... Wilmington, Del.
Wm. McMurtrie ..... New York City.
O. W. Palmenberg ..... New York City.
Herbert B. Baldwin ..... Newark, N. J.
H. B. Zimmele ..... New York City.
Geo. B. Bernheim ..... New York City.
A. H. Sabin ..... Long Island City, N. Y.
Henry P. Talbot ..... Boston, Mass.
T. F. Hildreth ..... New York City.
Robt. W. Page ..... Brooklyn, N. Y.
John Enequist ..... Brooklyn, N. Y.
J. James R. Croes ..... New York City.
Henry St. John Hyde ..... New York City.

Chas. E. Caspari.....New York City.
Alfred Tingle.....New York City.
L. M. Dennis.....Ithaca, N. Y.
Harry W. Jayne.....Philadelphia, Pa.
E. G. Love.....New York City.
Edward W. Morley.....Cleveland, O.
Arthur C. Langmuir.....New York City.
C. M. Allen.....Brooklyn, N. Y.
Francis H. Pough.....New York City.
H. S. Miner.....Gloucester, N. J.
G. W. Campbell Arnott.....New York City.
Peter O. Terheun.....Hohokus, N. J.
H. C. Sherman.....New York City.
Chas. W. Moulton.....Poughkeepsie, N. Y.
A. P. Hallock.....New York City.
Edmund Clark.....Flushing, N. Y.
David C. Eccles.....Brooklyn, N. Y.
James Purviance Atkinson.....New York City.
George C. Whipple.....Brooklyn, N. Y.
Horatio N. Parker.....Cambridge, Mass.
B. Smith Hopkins.....New York City.
Lyman F. Kebler.....Philadelphia, Pa.
Martin E. Waldstein.....New York City.
Nathaniel Thurlow.....Newark, N. J.
Fred. Crane.....Montclair, N. J.
Wm. E. Hillyer.....Baltimore, Md.
Thomas J. Keenan.....New York City.
Aug. H. Gotthelf.....Hastings-on-Hudson, N. Y.
George M. S. Neustadt.....New York City.
Joseph W. Richards.....Bethlehem, Pa.
Joseph Richards.....Philadelphia, Pa.
Hardee Chambliss.....New York City.
Elbert S. Platt.....Waterford, N. Y.
H. R. Carveth.....Ithaca, N. Y.
Alan A. Claflin.....Littleton, Mass.
Benj. C. Gruenberg.....New York City.
Herbert H. Wing.....New Brighton, N. Y.
F. J. Maywald.....Brooklyn, N. Y.
Emil Schlichting.....Philadelphia, Pa.
William H. Bassett.....Newark, N. J.
D. A. Van Ingen.....Newark, N. J.
S. Bookman.....New York City.
Frank W. Atwood.....Boston, Mass.
L. W. McCay.....Princeton, N. J.
Loomis Burrell.....Little Falls, N. Y.
Edmund H. Miller.....New York City.
E. Twitchell.....Wyoming, O.

Frank H. Thorp ..... Boston, Mass.
C. W. Volney ..... New York City.
S. A. Goldschmidt ..... Brooklyn, N. Y.
Ida Welt ..... New York City.
Alfred J. Wakeman ..... Greenwich, Conn.
E. B. Voorhees ..... New Brunswick, N. J.
Arthur A. Noyes ..... Boston, Mass.
M. R. Moffatt ..... Mamaroneck, N. Y.
G. N. Williamson ..... New York City.
W. P. Mason ..... Troy, N. Y.
Albert C. Hale ..... Brooklyn, N. Y.
Ira Remsen ..... Baltimore, Md.
Ernst J. Lederle ..... New York City.
Caswell A. Mayo ..... New York City.
Geo. C. Stone ..... New York City.
Durand Woodman ..... New York City.
Waldemar Lee ..... Passaic, N. J.
E. E. Olcott ..... New York City.
F. E. Dodge ..... Philadelphia, Pa.
Franke Stuart Havens ..... New York City.
Chas. G. Cook ..... Brooklyn, N. Y.
W. E. Chamberlin ..... New York City.
H. C. Ludwig ..... New York City.
F. Behrend ..... New York City.
Alfred E. Taylor ..... New York City.
Rudolf de Roode ..... Glens Falls, N. Y.
Thomas Le Cléar ..... New York City.
Charles E. Munsell ..... New York City.
Eugene H. Laws ..... Bedford, Mass.
Ludwig Saarbach ..... New York City.
Samuel Harold Baer ..... New York City.
Charles T. Whittier ..... Brooklyn, N. Y.
E. C. Wallace ..... Long Island City, N. Y.
J. L. Fuelling ..... Jersey City, N. J.
David S. Brown, Jr ..... New York City.
Morris Loeb ..... New York City.
Walter S. Cameron ..... New York City.
Rudolph Seldner ..... Brooklyn, N. Y.
Montgomery B. Smith ..... Smelter, Mont.
George A. Soper ..... New York City.
Edward Hart ..... Easton, Pa.
H. T. Vulté ..... New York City.
M. F. Schaak ..... Brooklyn, N. Y.
Arthur C. Neish ..... New York City.
Edward F. Kern ..... Knoxville, Tenn.
Wm. Jay Schieffelin ..... New York City.
Lily Logan ..... Howardsville, Va.

Ann Hero.....Brooklyn, N. Y.
T. Lynton Briggs.....Ridgewood, N. J.
H. W. Wiley.....Washington, D. C.
John Prochazka.....New York City.
Ernst Bischoff.....New York City.
Alois von Isakovics.....New York City.
Chas. Warren Hunt.....New York City.
Harriet F. Hale.....Brooklyn, N. Y.
Carl Hering.....Philadelphia, Pa.
Joseph K. VanDenburg.....Brooklyn, N. Y.
Caroline R. Almy.....Brooklyn, N. Y.

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